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ABSTRACT

This document presents information on the physical and human geography of the Netherlands. In this third revised edition, the contents have been brought up-to-date and expanded. In addition, sections on physical planning and environmental problems have been added. The booklet is intended for use by geography classroom teachers and students at upper elementary and secondary levels. The booklet contains 19 short descriptive analyses. Each section is well illustrated with diagrams and maps. Titles of the sections are The High and Low Netherlands, Land Reclamation, Polders, The Zuyder Zee Works, The Delta Works, Water Control, Demography, Distribution of the Population, The Randstad, The Economy, Agriculture, Mineral Production, Industry, Trade and Traffic, Amsterdam and Rotterdam, Physical Planning, and The Environment. Reproduction of maps and materials in the document is encouraged for classroom and review purposes. (DB)

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compact geography of the netherlands

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Third Edition

SP 012 681

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Cover: relief map showing provinces, national capital and provincial capitals.

Scale: approx. 1 : 2 000 000.

dark green – below sea level
light green – 0 - 5 metres above sea level
yellow-green – 5 - 20 metres above sea level
orange – 20 - 50 metres above sea level
light brown – 50 - 100 metres above sea level
dark brown – more than 100 metres above sea level
yellow – dunes

Foreword

The *Compact Geography of the Netherlands* has been compiled at the request of the Ministry of Foreign Affairs in The Hague by the Information and Documentation Centre for the Geography of the Netherlands (IDG). In 1963 the Council of Europe requested its member countries to appoint experts in the field of geography to arrange the exchange of data in order to bring about an improvement in the accounts of the geography (or elements of the geography) of their countries in the textbooks. This request led to the establishment of the IDG in Utrecht in 1964 and of an IDG bureau in 1971. The stream of requests for information grew every year. From the correspondence there emerged the need for a short summary of the geography of the Netherlands.

Both the time devoted to the subject of geography in the curriculum and the method vary from country to country. For this reason an arrangement was chosen from which each user can take what he needs, although the possibility remains that, in view of the differences between countries, the material provided will comprise too much for some and not enough for others.
The present version is the third edition. Not only have the contents been brought up-to-date relative to the previous edition, but they have been expanded (with a second section on physical planning and one on the problems of the environment) and, in various places, drastically revised or re-written. The cartographic material was also drastically altered. The sequence of the chapters had to remain unchanged because of the references in the *Pictorial Atlas of the Netherlands*, a publication closely related to the 'Compact Geography', which appeared in 1977.
These booklets are intended for students of geography, teachers in secondary schools and in the higher classes of primary schools. They are intended to serve in part as a commentary to the *School Map of the Netherlands* (scale 1:325,000), which is also published by the Ministry of Foreign Affairs in collaboration with the IDG. In order to keep the users of this information regularly supplied with recent data, an annual *IDG Bulletin* is also published.

For further information, documentation or literature lists about the geography of the Netherlands you are invited to contact the Bureau of the Information and Documentation Centre for the Geography of the Netherlands, Rijksuniversiteit, Heidelberglaan 2, 3508 TC, Utrecht, Netherlands.

Writers of textbooks are permitted to reproduce the maps, etc., from this booklet, provided they mention the source. Photographs to illustrate such books may also be requested from the IDG or from the Dutch embassies, where it is possible to make a choice from a limited set of photographs.

Utrecht – The Hague, 1979.

Introduction

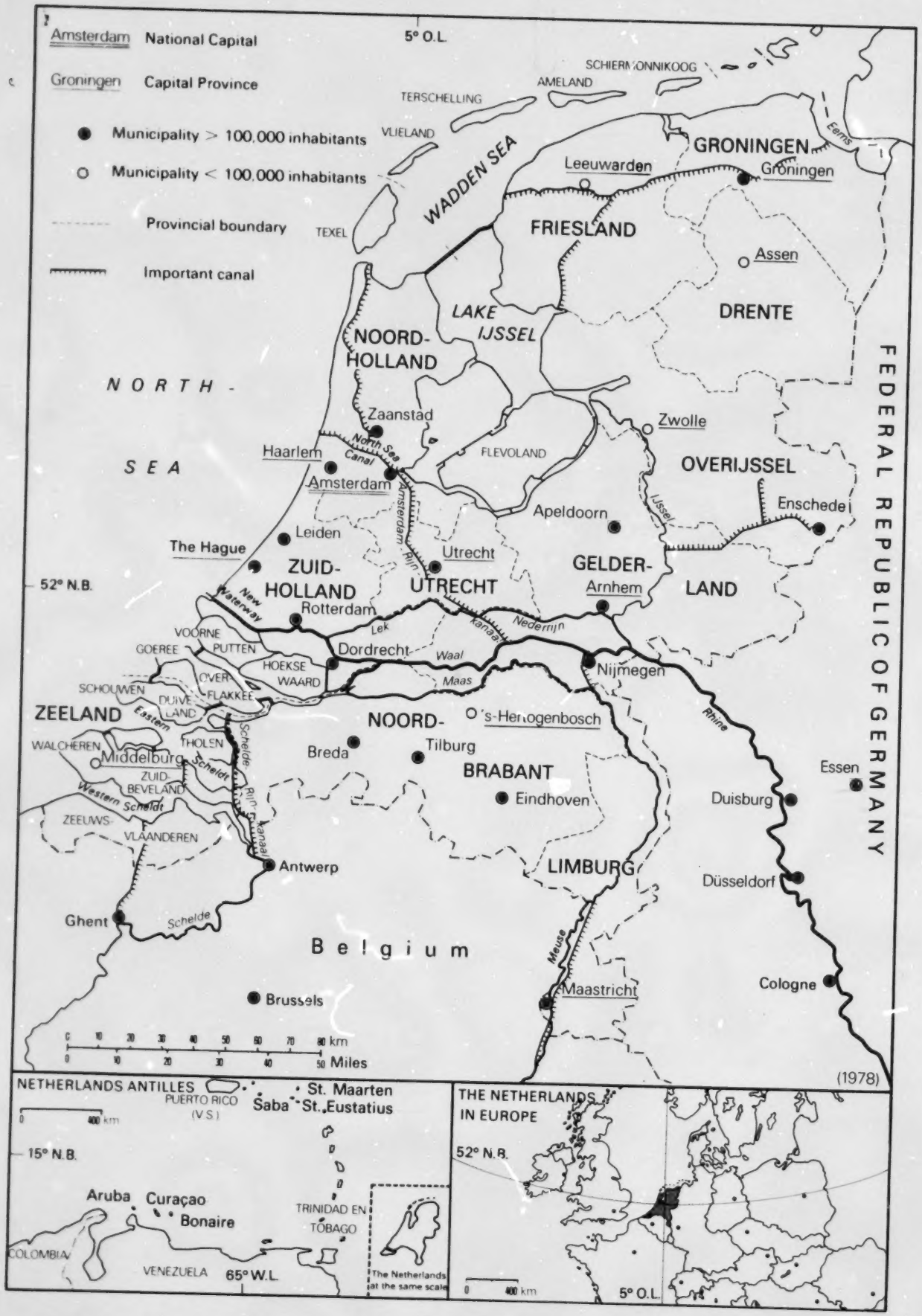
Low and flat, small and full
The relief map on the cover of this booklet illustrates a first impression which defines the image of the Netherlands for many people in other countries: the country is low-lying; partly even below sea level. Permanent habitation did not become possible here until people were able, through the construction of dikes, to beat off most of the attacks of the sea. Only in the extreme south-east do altitudes above 200 metres occur.
A second characteristic (see key on p. 2) is that the country is flat – it has little relief. The Dutch have traditionally made good use of its situation on the sea and rivers, so that it was precisely the western, low-lying, coastal areas which became the most densely populated. This concentration also brought problems with it, concerning, for example, housing and recreation, traffic and environmental pollution. Before these aspects are dealt with in the following chapters, we give first some general information.

Form of government
The Netherlands is a parliamentary democracy under a constitutional monarchy. The head of state is H.M. Queen Juliana.
The Parliament consists of two chambers, elected by universal suffrage (for men and women). The capital is Amsterdam, but the seat of government is The Hague ('s-Gravenhage - Den Haag).

Situation
The Netherlands, which covers an area of 36,948 square kilometres, is situated on the west side of the Eurasian continent between approximately 50°45′ and 53°30′ north latitude and 3°30′ and 7° east longitude. It is situated on the North Sea and at the mouths of the rivers Rhine, Meuse and Scheldt. From the point of view of physical geography the country is a delta and forms part of the plain of northern and western Europe. The highest point is situated in the extreme south-east at 321 m. and the lowest point is north of Rotterdam at 6.70 m. below sea level (see map on p. 7). Of the total land area 27% is below sea level and this part of the country is inhabited by about 60% of the total population.
From its situation the Netherlands derives a temperate maritime climate, with an average January temperature of 1.7°C and a July average of 17°C. The total annual precipitation exceeds 700 mm. and this is distributed fairly evenly throughout the year.

Provinces and population
The Netherlands is divided into eleven provinces, which are subdivided into 833 municipalities. With 13.9 million inhabitants (1st Jan 1978) – i.e. an average of 411 people per square kilometre of land – it is among the most densely populated countries in the world.

Historical notes
In the 17th century, the so-called Golden Age, the Dutch built up a world-wide trading network, with trading stations on many coasts. Large undertakings (civil companies) often controlled whole states and complexes of states (including Indonesia, Sri Lanka, parts of Brazil and southern Africa).
In the Netherlands itself art and culture flourished at that time (e.g. Rembrandt, Vondel). Because the other European states were beginning to protect their own growing trade and industry, Dutch commerce stagnated. A second flowering covered the period between 1850 and 1910.
During the Second World War the governments-in-exile of the Netherlands, Belgium and Luxembourg decided to set up a customs union after the war and this was later expanded into an economic union. The latter served as a model for the establishment of a European Economic Community, which had as its aim the unrestricted movement of money, goods and people.
The Netherlands is member, *inter alia*, of the United Nations, the OECD, the EEC and NATO.
In 1943, on the initiative of the late Queen Wilhelmina, a start was made on changing the political relationship with the colonies, which could become partners enjoying equal rights within the Kingdom on a voluntary basis. Indonesia chose to go its own way in 1948. Surinam became independent in 1975. The Netherlands Antilles still form part of the Kingdom of the Netherlands, although negotiations will take place in the near future about the degree of independence of these territories.


Amsterdam National Capital
Groningen Capital Province
Municipality > 100,000 inhabitants
Municipality < 100,000 inhabitants
Provincial boundary
Important canal
5° O.L.
SCHIERMONNIKOOG
AMELAND
TERSCHELLING
VLIELAND
TEXEL
WADDEN SEA
Eems
GRONINGEN
Leeuwarden
Groningen
FRIESLAND
Assen
DRENTE
LAKE IJSSEL
NOORD-HOLLAND
NORTH-SEA
Zaanstad
North Sea Canal
Haarlem
Amsterdam
Amsterdam Rijn
FLEVOLAND
Zwolle
OVERIJSSEL
IJssel
Enschede
Apeldoorn
Leiden
The Hague
ZUID-HOLLAND
Utrecht
UTRECHT
GELDER-LAND
Arnhem
52° N.B.
New Waterway
Rotterdam
Lek
Nederrijn kanaal
VOORNE PUTTEN
GOEREE
Dordrecht
Waal
HOEKSE WAARD
Nijmegen
Maas
SCHOUWEN
OVER FLAKKEE
DUIVE LAND
ZEELAND
Eastern Scheldt
NOORD-
's-Hertogenbosch
Rhine
WALCHEREN
Middelburg
THOLEN
Scheldt
Breda
Tilburg
BRABANT
Essen
ZUID-BEVELAND
Western Scheldt
Eindhoven
Duisburg
ZEEUWS-VLAANDEREN
Rijn-Schelde kanaal
Antwerp
LIMBURG
Düsseldorf
Ghent
Schelde
Meuse
Belgium
Maastricht
Cologne
Brussels
0 10 20 30 40 50 60 70 80 km
0 10 20 30 40 50 Miles
(1978)
FEDERAL REPUBLIC OF GERMANY
NETHERLANDS ANTILLES
PUERTO RICO (V.S.)
St. Maarten
Saba
St. Eustatius
0 400 km
15° N.B.
Aruba
Curaçao
Bonaire
TRINIDAD EN TOBAGO
COLOMBIA
VENEZUELA
65° W.L.
The Netherlands at the same scale
THE NETHERLANDS IN EUROPE
52° N.B.
0 400 km
5° O.L.

The High and Low Netherlands

The Netherlands without dikes

If the Netherlands were to lose the protection of its dunes and dikes the most densely populated part of the country would be inundated (largely by the sea, but in part also by the rivers). This part of the Netherlands – indicated in white on the map – which generally does not lie higher than 1 metre above sea level*, covers more than half of the total area of the country and is called the 'Low Netherlands', while the area shown in grey is termed the 'High Netherlands'. This situation can be explained from the course of the country's geological history.

Geology

The rocks formed up to and including the Tertiary generally lie below the surface in the Netherlands, dipping from south-east to north-west. Only in a few places in the south-east and east of the country do these rocks, which include chalk marl, appear at the surface.

The surface of the Netherlands consists almost entirely of sediments laid down during the Quaternary period. In the penultimate Pleistocene glaciation – the Riss or Saale period – large ice sheets extended over the Netherlands from Northern Europe, with outliers reaching to the line Haarlem-Nijmegen. In the south-north trending river valleys of what are now the provinces of Utrecht, Overijssel and Gelderland (the Central Netherlands) the valley walls were pushed sideways and upwards to form what are now elongated hill ridges (the so-called 'push moraines', which now form a recreational area of national significance). During the ice ages the coastline of the North Sea lay much farther to the north-west, because the sea level had fallen considerably. After the ice had melted there remained in the north of the country an extensive area of glacial drift, consisting of sand, gravel, boulder clay and erratics.

Already before the Ice Age the rivers Rhine and Meuse had deposited thick layers of sand and gravel in the central and southern parts of the Netherlands, originating in the Alps and the European *mittelgebirge*.

After the disappearance of the ice sheets the north-westerly and westerly winds blew sand over the Netherlands, which came, among other places, from the dried-up floor of the North Sea. This sand largely covered the ground moraine, the push moraines and the river deposits. In the ensuing Holocene period the climate became warmer and the sea level rose. The North Sea flooded the western part of the Netherlands as far as the line Groningen-Utrecht-Breda. The cross-section of the western Netherlands shows clearly that the Pleistocene strata dip down towards the west.

During the periods in which the rise in sea level took place in the western Netherlands sand-bars were thrown up, running parallel to the present coastline. In the course of time they were transformed into low dunes, now referred to as the 'old dunes'.

In about the year 1000 A.D. renewed dune formation occurred. These 'young dunes' are higher and lie partly to the west of and partly above the 'old' dunes. Behind the old dunes a kind of lagoon was formed, into which the sea could penetrate by way of gaps in the chain of dunes. Initially, marine clay was deposited in the lagoon, but later there was growth of peat as the lagoon became increasingly shallow. Sometimes the peat was washed away by the sea, particularly in the south-west and northern Netherlands, where further marine clay was deposited.

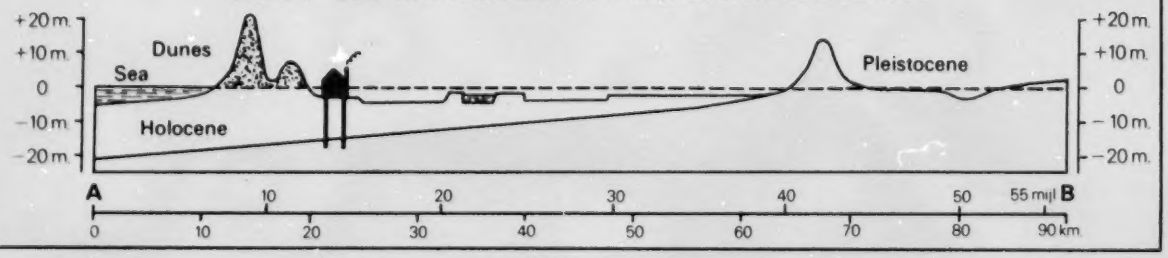
In the central part of the Low Netherlands the peat was later wholly or partly dug away in many places, giving rise to lakes. Where these were subsequently drained, polders were formed, with floors of marine clay or peat. Peat formation also occurred in a number of marshy areas in the High Netherlands.

The deposition of fluvial sediments – predominantly sands and clays – was limited during the Holocene largely to the region of the great rivers.

The peat soils, in particular, in the Low Netherlands have subsided relative to sea level since the Middle Ages. This shrinkage of the soil resulted from the fact that man in this part of the country was compelled to control the groundwater level artificially, i.e. to lower it.

* By 'sea level' is meant in the Netherlands the Normal Amsterdam Datum (NAP), which is approximately mean *high* water level.

CROSS- SECTION THROUGH THE WESTERN NETHERLANDS



Land Reclamation

History

After about 700 B.C. the sea sometimes advanced so far that areas of peat behind the dunes were washed away. In the south-west and northern Netherlands only islands remained. The former Zuyder Zee, which reached its greatest extent in about 1250 A.D., was also formed in this manner.

The inhabitants of the Netherlands have themselves also contributed to the loss of land to the water through the digging away of peat, which was used as fuel and as a source of salt. In the peat region of North and South Holland and the province of Utrecht, in particular, the lakes continually increased in size (see also p. 6). The struggle which the inhabitants of these areas carried on against the water was initially purely defensive in character. They first built homes or villages on artificial mounds (terps). When they began to link the 'terps' together by means of dikes they also created the possibility of keeping the land dry. Expansion of the technical possibilities, such as the building of windmills which could be turned into the wind, enabled the people to pass gradually from defence to the attack.

In the 17th century, the 'Golden Age', a start was made on the drainage of a number of the lakes referred to above. There were various reasons for this, such as the increased demand of the growing towns for food, the capital resources and business enterprise of the Amsterdam merchants, the technical possibilities of the ever-improved windmills and the fear of floods. The process continued until late in the 19th century, when the windmill had meanwhile been replaced by the steam engine. An example is the great Haarlemmermeer (Haarlem Lake) south-west of Amsterdam, where the State for the first time took an active part in the drainage work. The bar chart shows the area of land reclaimed each century during the period from 1200 to the present day.

In the archipelago of the south-west Netherlands and in the coastal areas of the northern Netherlands there was already land reclamation in 1200, but this occurred in a different manner. The sea flowed in twice a day at high tide and left behind sand and silt as it retreated. When this process had continued for long enough, these lands came to lie above sea level, at least if no storm surges had occurred for a long time. The silted-up lands were surrounded by a dike to protect them against the water. In the north of Groningen and Friesland a system was developed in the 19th century to accelerate the accretion process, namely, the building of low dams in the sea, behind and between which sand and silt could quietly settle. This process is continuing up to the present time.

The 20th century

After 1900 land reclamation was undertaken on a still larger scale. An ambitious plan was drawn up for reclaiming part of the Zuyder Zee. The first polder, the Wieringermeer, fell dry in 1930, by which date the steam pump had been replaced by diesel and electrically driven pumps. In 1932, the Zuyder Zee – thereafter called the IJsselmeer (Lake IJssel) – was sealed off from the Wadden Sea by a 30-kilometre barrier dam. Of the five polders planned four have been completed (on this matter, see also pp. 12-13).

Smaller areas which were reclaimed from the water in the very recent past are the Lauwers Sea (on the north coast between Friesland and Groningen) and the Maasvlakte, south of the entrance to the New Waterway, reclaimed to permit the expansion of the Rotterdam-Europort port and industrial zone. Landscape experts and biologists, among others, raised great objections to the partial reclamation of the Wadden Sea. This sea, most of which falls dry twice a day because of its shallow depth and great tidal range, forms a region for birds and recreation which is unique in the world. It therefore appears extremely improbable that large-scale reclamation will ever take place here.

With this completion of land reclamation the Dutch have won back again approximately all the land that had to be abandoned to the sea during the course of the centuries.

Land reclamation 1200- 1600
Land reclamation 1600- 1900
Land reclamation 1900- 1970
Land reclamation in future
Lauwersmeer
Leeuwarden
Groningen
WADDEN-
ZEE
Assen
IJSSEL-
MEER
NORTH SEA
Zaanstad
Zwolle
Haarlem
Amsterdam
Leiden
Apeldoorn
Enschede
Den Haag
Utrecht
Arnhem
Maasvlakte
Rotterdam
Dordrecht
Nijmegen
's-Hertogenbosch
Breda
Tilburg
Middelburg
Eindhoven
Maastricht
0 10 20 30 40 50 60 70 80 km
0 10 20 30 40 50 Miles
(1978)
LAND RECLAMATION PER CENTURY IN KM²
1200-1300 350
1300-1400 350
1400-1500 425
1500-1600 710
1600-1700 1120
1700-1800 500
1800-1900 1170
1900-2000 2300
0 500 1000 1500 2000 2300 km²

Polders

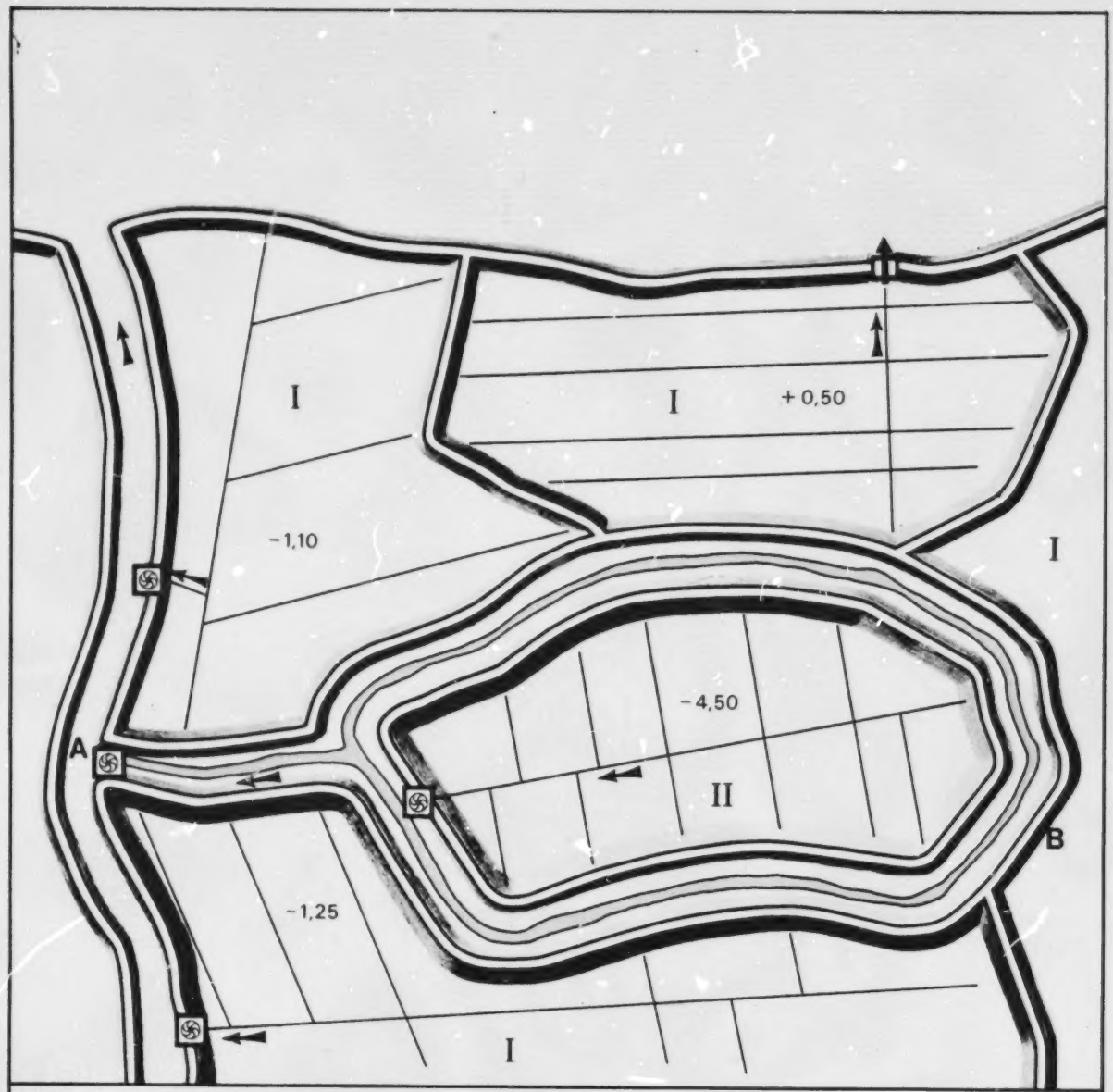
Hundreds of polders
Dunes and dikes protect the Low Netherlands against flooding. Dikes and drainage canals form dominant elements in the landscape of this part of the country. Almost the whole of the west and the low north (c. 50% of the total land area) consists of polders: land which is usually surrounded by dikes and within which the groundwater level can be controlled.
Polders do not necessarily lie below sea level, although this is true of the IJsselmeer polders, for example (3-5 metres below sea level), and of the polders created by pumping out lakes (up to −6.7 metres below sea level, see p. 4). The polders in the peat regions lie at about 1 metre below sea level, while in the areas of young marine clay and along the rivers, many polders lie above average sea level. It is consequently not always necessary to discharge the water by pumping: the marine clay polders along the coast of Groningen and Friesland, for example, are adequately drained by opening the sluice gates in the drainage canals at low tide.
The total number of polders reaches many hundreds. This is because, in earlier centuries, pumping was done by windmills, which were not capable of draining a large area. As the technology advanced and the windmills were replaced successively by steam, diesel and electric pumps, the polders increased in size (cf. the IJsselmeer polders).

Drainage techniques
Two main types of polder can be distinguished on the map:
I— polders surrounded by a dike and
II— a polder surrounded by two dikes, separated by a ring canal.

To the first type belong, inter alia, the river and marine polders, situated respectively along a river or on the coast. Here the surplus water can generally be discharged directly to the 'outside water' (sea or river), with or without the aid of a pump. To the second type belong the drained lakes, known as 'droogmakerijen', which are usually very low-lying polders. The inner dike, situated around the former lake, is called the ring dike. It is surrounded by the ring canal, which borders the dikes of the neighbouring polders.
The cross-section shows a much-applied system of water control. Each polder has a specified groundwater level relative to ground level – the polder datum. The desired level is determined mainly by the use to be made of the ground. If the water rises too high at a particular moment, the pump is started and the surplus water is raised to the 'boezem', situated at a higher level. The 'boezem' is a system of lakes, canals, etc., which functions as a temporary reservoir. From there the surplus water is discharged into the outer water, either naturally, or by further pumping.

Polder organisation
Already in the Middle Ages the polder inhabitants were faced with the task of safeguarding an area by joint effort once it had been wrested from the water. At that time were created the first 'waterschappen' (drainage districts), of which there were still 577 on 1st January 1978. (Because of reorganization their number continually declines). They are public bodies, coming under the jurisdiction of the provincial authorities. The drainage district boards are elected by the 'ingelanden' (usually proprietors) of the polders belonging to the drainage districts. In districts which have the task of defence against the sea, Lake IJssel or the great rivers, the members of the executive are appointed by the Crown.
The activities of the drainage districts lie in the field of the maintenance of the water defences, the water economy (quantitatively and qualitatively), the roads and waterways, and sometimes also recreation and nature protection. The financial means for carrying out these tasks are derived from a drainage district tax levied on the proprietors, supplemented if necessary by grants from the central or provincial government.

11



Dike

Polder ditch

Pumping station

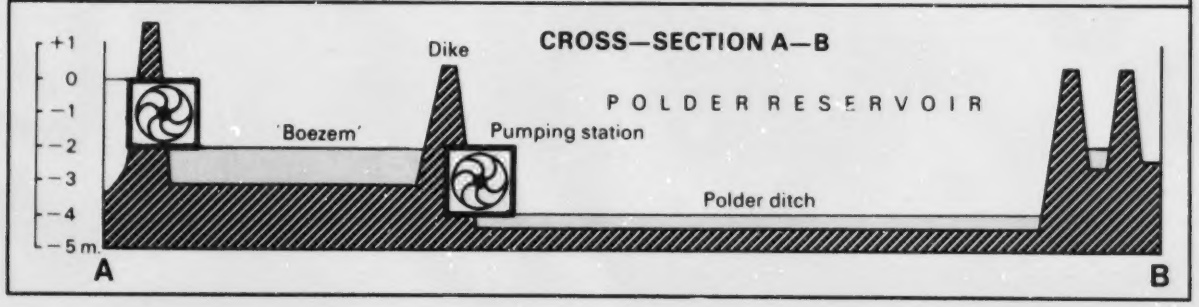
'Boezem'

External water (river and sea)

Direction of discharge of water

-4.50 Depth in metres below sea level

Discharge sluice (without pumping station)



The Zuyder Zee Works

History

At the beginning of the Christian era the Zuyder Zee was a relatively small lake into which various rivers drained and which had a narrow connection with the North Sea. Because of the action of the tides and of the wind, in particular, the lake was enlarged into its ultimate, nearly circular, extent.

The oldest plans for drainage were those of Hendrik Stevin (1667). Towards the end of the last century, the engineer C. Lely, secretary of the Zuyder Zee Association (the drainage question had meanwhile become a matter of national concern) worked out the plan that would later be carried out in its broad outline.

– a broad dam from the coast of North Holland to the coast of Friesland, turning the inland sea (Zuyder Zee) into a lake (Lake IJssel);

– along the coast of the lake, where the ground consisted largely of clay, five large polders, thereby increasing the area of the Netherlands by about 6% (c.2,050 sq.km.);

– in the north, where the majority of the sandy soils and the greatest depths occur, a reservoir fed by the River IJssel and connected with the sea via sluices in the barrier dam for the discharge of surplus water.

In 1920, when Lely was Minister of Transport and Water Affairs, a start was made on the execution of this plan, after a flood disaster in 1916 and food shortages during the First World War had emphasised its necessity once again. The first polder, the Wieringermeer, fell dry in 1930. The 30-kilometre long Afsluitdijk (barrier dam) was completed in 1932. The North East Polder followed in 1942 and Eastern and Southern Flevoland in 1957 and 1968, respectively. The main function of the marginal lakes adjoining the two Flevoland polders is to prevent the groundwater level in the bordering, higher, areas of the 'old land' from sinking too far.

Use of the reclaimed land

After the land has been made accessible and usable (a process which requires several years), the polders are laid out. The objectives of the planning of the polders are to achieve a good arrangement of parcels and optimum size of holding, good access by roads and canals and appropriate vegetation cover. The soil consists for 90% of land excellently suited to agriculture and, particularly, to arable farming. The land which becomes available is exploited by the State during the first few years and then leased or sold to farmers, coming from all parts of the country.

In each polder a number of villages and one or more larger places were planned as service centres. Of these Lelystad is intended to expand into a centre for the whole of the southern Lake IJssel region. In view of the plans for changing the administrative division of the country (see p. 38) it is no longer likely that all the polders will one day form the twelfth province of the Netherlands.

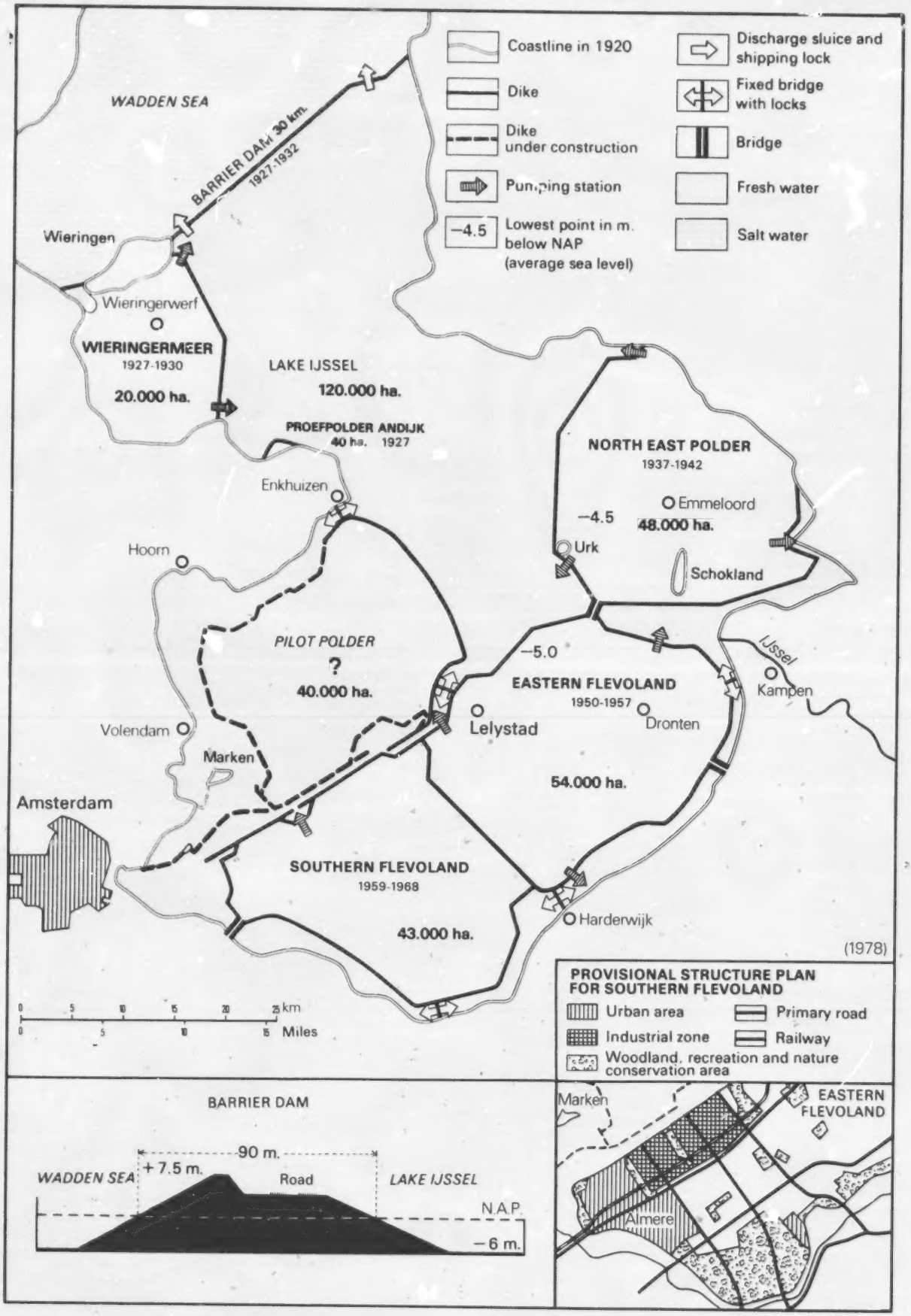
The original intention was to use the five projected polders almost exclusively to increase agricultural production. After the Second World War, however, the polders were partly zoned for residential use, recreational use and as sites for industries and services. The reasons for this are to be found, among other things, in changed circumstances (such as shifts in the economic structure and urbanisation), and in the fact that the more recently drained polders are situated relatively close to the Randstad (see also p. 22). The provisional plan for the layout of Southern Flevoland, illustrated opposite, gives an impression of what is intended. Like Lelystad, the town of Almere will function as a reception area for the overspill population from the northern part of the Randstad.

Because of further changes of attitude, caused by such things as developments in European agriculture, increased concern for the environment and the decline in population growth, a discussion has been set in train about the question of whether it is desirable or justified to reclaim the final polder, the Markerwaard.

Consequences for the surrounding areas

In the 'old land' surrounding Lake IJssel the flood danger has been greatly reduced and an improved water economy has become possible. The roads along the barrier dam and through the new polders mean a shortening of the traffic links between the surrounding areas.

The consequences were less favourable for a number of fishing villages around the former Zuyder Zee, although three sets of shipping locks in the barrier dam permit the fishermen to continue their occupation on the open sea. The fishermen of the former island of Urk, in particular, avail themselves of this possibility.

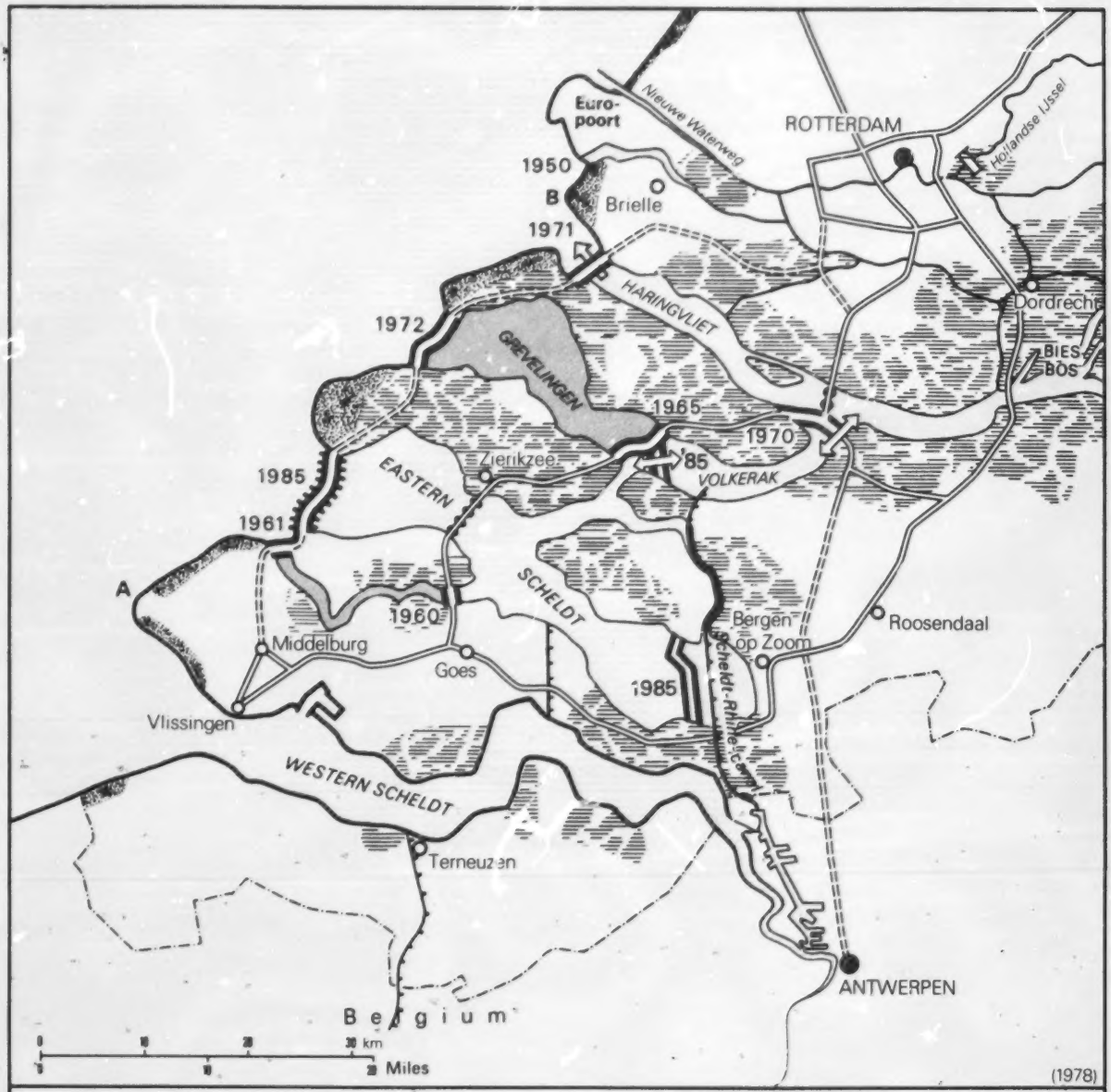

Coastline in 1920
Dike
Dike under construction
Pumping station
−4.5 Lowest point in m. below NAP (average sea level)
Discharge sluice and shipping lock
Fixed bridge with locks
Bridge
Fresh water
Salt water
WADDEN SEA
BARRIER DAM 30 km. 1927-1932
Wieringen
Wieringerwerf
WIERINGERMEER
1927-1930
20.000 ha.
LAKE IJSSEL
120.000 ha.
PROEFPOLDER ANDIJK
40 ha. 1927
NORTH EAST POLDER
1937-1942
Emmeloord
−4.5
48.000 ha.
Urk
Schokland
Enkhuizen
Hoorn
PILOT POLDER
?
40.000 ha.
−5.0
EASTERN FLEVOLAND
1950-1957
Lelystad
Dronten
IJssel
Kampen
Volendam
Marken
54.000 ha.
Amsterdam
SOUTHERN FLEVOLAND
1959-1968
43.000 ha.
Harderwijk
(1978)
0 5 10 15 20 25 km
0 5 10 15 Miles
PROVISIONAL STRUCTURE PLAN FOR SOUTHERN FLEVOLAND
Urban area
Industrial zone
Woodland, recreation and nature conservation area
Primary road
Railway
BARRIER DAM
90 m.
+7.5 m.
WADDEN SEA
Road
LAKE IJSSEL
N.A.P.
−6 m.
Marken
EASTERN FLEVOLAND
Almere

The Delta Works

The disaster of 1953
The execution of the so-called 'Delta Plan' was accelerated by the great flood disaster which struck the South West Netherlands on 1st February 1953, causing more than 1,800 deaths and inundating 160,000 hectares of land. The plan meant not only a reduction of the flood danger through the construction of a number of dams, but aimed at the same time at a general improvement in the water economy and increased accessibility of the archipelago. In this project land reclamation is of little significance.

The Delta Plan
As early as 1950 the Brielse Maas (arm of the Meuse) was closed off by a dam. The first work to be completed after the disaster of 1953 was a movable storm surge barrier in the Holland IJssel, east of Rotterdam. If, after the completion of the Delta dams, the water in the New Waterway (not sealed off because of the shipping interests of Rotterdam) is ponded up during a gale, this barrier will be able to safeguard a large part of the polderland in the Western Netherlands from flooding.
As the dates on the maps show, two 'secondary' dams, situated farther inland, and the largest of the 'primary' dams, that in the Eastern Scheldt, have still to be built. The whole project can be completed by 1985. The dikes along the open New Waterway and Western Scheldt are being strengthened.
A number of new techniques were developed for sealing the estuaries, such as closing the final gaps with the aid of caissons, concrete chambers as large as a block of flats, which float on the water and are provided with gates at front and back. The caissons are sunk at the desired position, then all the gates are closed simultaneously and the caissons filled with sand. After this the remainder of the body of the dike can be built over the caissons. In other dams the gaps were closed by dropping blocks of concrete from an overhead cableway. In the dam in the Haringvliet 17 large discharge sluices were built (for the purpose of these, see pp. 16-17); the Volkerak Dam contains locks for the use of the shipping on the canal linking the Scheldt with the Rhine.

Consequences
Through the implementation of the Delta Plan the sea is largely banished from the waters of the South West Netherlands. In addition to the great advantage of the reduced danger of flooding, this also means that the struggle against the seepage of salt water – the enemy of farmers and growers in the whole of the Low Netherlands – can be waged successfully here. New possibilities were also created for the supply of drinking water and for water-sports.
A further important effect is the opening up of this previously isolated archipelago by the roads which have been, or are being, constructed over the 10 dams and 2 bridges. This has set in motion radical changes in the traditional agricultural picture of the Delta region. It is to be expected that industrial and commercial activities and the accompanying urbanisation will develop further, particularly in the north of the region (Rotterdam-Europort), in the east alongside the new land and water links between Rotterdam and Antwerp and in the south along the Western Scheldt (Flushing, Terneuzen). The central zone must, in the first place, retain its agricultural function, while the sea coast – with its wide area of dunes – and the inland lakes offer recreational possibilities to the inhabitants of the Randstad, among others.
A radical scheme such as the Delta Plan unavoidably also brings with it disadvantages. It was clear from the beginning that the coastal fisheries (mussels, shrimps, etc.) and oyster cultures would suffer serious damage and become to some extent impossible. During the course of the 1960's increasingly loud protests were also heard from the side of the environmentalists. A discussion on the environmental aspects carried out over many years has ultimately resulted in far-reaching changes in the plans for sealing off the Eastern Scheldt. The primary dam is being carried out as a 'pier dam' in which closable openings (to be closed only in the event of flood danger) will enable salt water to enter the estuary and about 75% of the tidal movement to be maintained. As a result, serious damage to the natural environment in the Eastern Scheldt will be limited and the oyster cultures will not be destroyed. This change makes it necessary to build two additional secondary dams in order to separate the waters farther to the east from salt and tides.



REDUCTION OF THE ROAD DISTANCE

Distance from Rotterdam to Flushing before the Delta Plan (via Roosendaal) : 150 Km

Distance from Rotterdam to Flushing after the Delta Plan (via Zierikzee) : 110 Km

SHORTENING OF THE COASTLINE

Length of the Coastline from A to B before the Delta Plan : 800 Km

Length of the Coastline from A to B after the Delta Plan : 80 Km

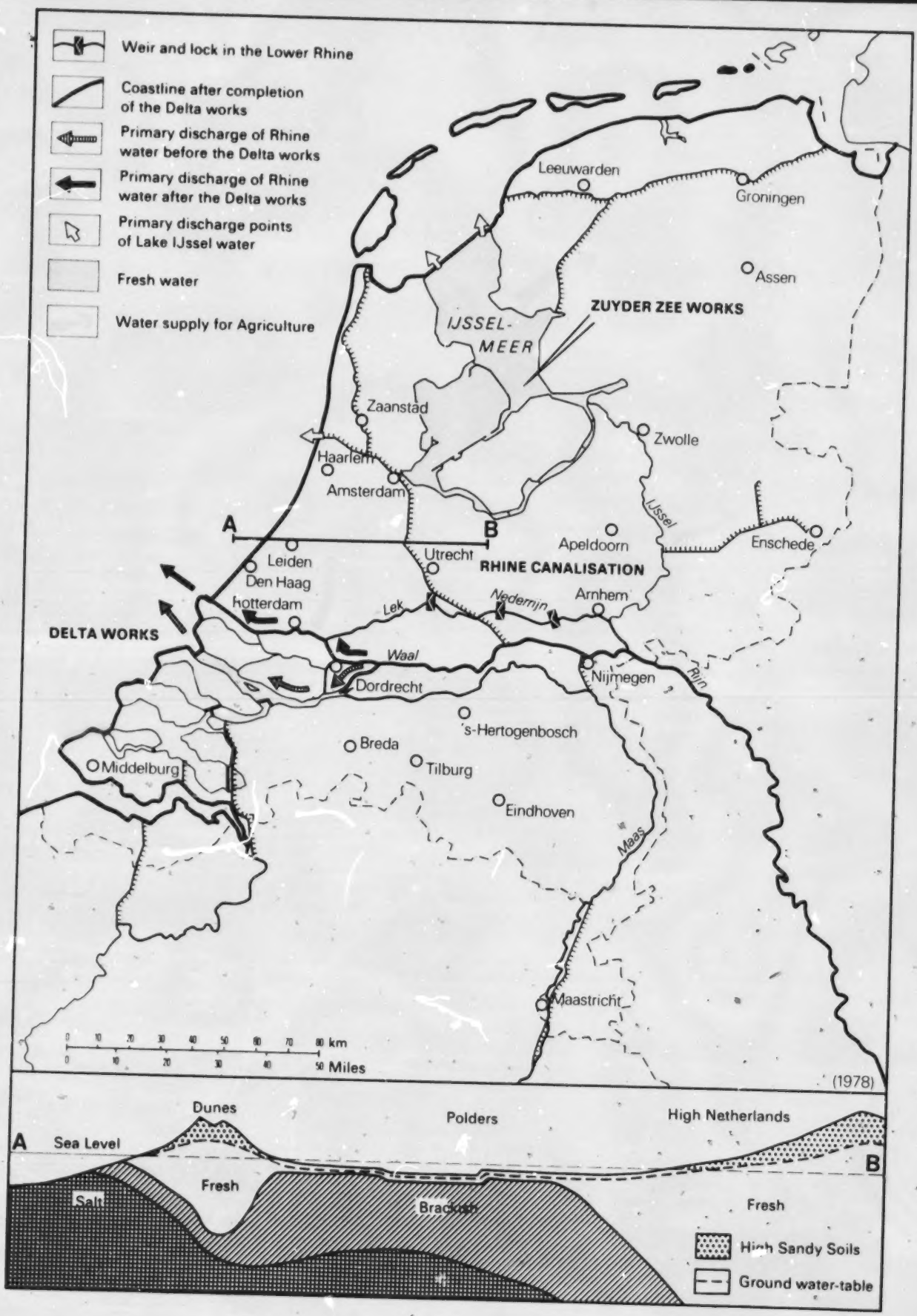
Water Control

General
In a well-watered and densely populated country like the Netherlands a good measure of water control, both in the soil and in the rivers, lakes and canals, is necessary. Many purposes can be served by this, such as drinking water supply, reduction of flooding, prevention of salt water seepage, water supply for farms and industry, as well as the guaranteeing of sufficient depth for navigation.

Rhine canalisation
The Zuyder Zee and Delta works are of great importance for water control, because they give increased security and provide fresh water reservoirs with a water level which can be regulated. In combination with a third project – the canalisation of the Lower Rhine – a better control of the water economy in almost the whole of the Netherlands is now possible.
In the Rhine three weirs have been built with shipping locks, for which a completely new form of construction has been employed. The water can be held back by means of two semi-circular, movable 'visor weirs', under which the shipping can pass freely when they are raised. The most easterly of the weirs enables more water to be channelled along the Gelderland IJssel into Lake IJssel, to the benefit in particular of navigation on the IJssel and of agriculture in the North and East Netherlands. Without further measures, however, the discharge of water by way of the River Lek to the sea would be so diminished that navigation would no longer be possible. Moreover, the salt water, which already penetrates inland above Rotterdam at high water, would be able to penetrate even farther. To fight the first evil two further weirs were built downstream in the Lower Rhine and Lek. In order to combat the seepage of salt water it is important that, because of the closing off of the northern Delta waters, the water of the Meuse and Waal is forced to flow into the sea past Rotterdam. It is the dams in the Volkerak and Haringvliet, in particular (see pp. 14-15), which ensure this, but in order to prevent flooding in Rotterdam and district, for example, during periods of high water discharge by the great rivers, the Haringvliet Dam has been provided with 17 discharge sluices.

Water Quality
The account given above relates mainly to matters of *quantity*: the care for sufficient water for navigation, for an optimum groundwater level etc. In addition, there is the increasing concern for the *quality* of the water. Apart from the seepage of salt from the sea, the water is threatened increasingly by pollution from the cities both of the Netherlands and neighbouring countries, and from agriculture and industry. The rivers carry dirty water from certainly five neighbouring and more distant countries into the Netherlands. There is more about this on pp. 42-43 ('Environment'). Special attention will be devoted here to the specific problems of drinking water supply.

The supply of drinking water
The supply of drinking water is a matter of special concern in the polder district of the Low Netherlands. The cross-section shows that brackish and salt groundwater here come close to the surface. Among the reasons for this is that, before the dunes were formed, this area was washed over by the sea. Moreover, the fresh surface water in the polders is being continually discharged, while salt water seeps up from under the dikes and dunes (see cross-section). As a result, the groundwater in this area cannot be used everywhere for drinking water, as it can in the High Netherlands and the dune areas. In order to prevent the exhaustion of the store of fresh water under the dunes, river water, brought by pipeline, is injected in a number of places in the dunes (see also p. 43).
In the polderland, and especially in the area around Rotterdam, the population has to rely on surface water which, particularly if it has to be taken from the rivers, is increasingly liable to pollution. Efforts are being made through international agreements and internal measures to remove the causes of this river pollution. In addition, attempts are being made in the Netherlands to combat the consequences in various ways, especially as they affect the water supply. This is being done, not only through the usual purification processes, but also by storing up the water during periods of high river discharge, i.e., when there is a relatively low level of pollution. This is achieved, inter alia, by injection in the dunes and storage in reservoirs (e.g. in the Biesbosch).


Weir and lock in the Lower Rhine
Coastline after completion of the Delta works
Primary discharge of Rhine water before the Delta works
Primary discharge of Rhine water after the Delta works
Primary discharge points of Lake IJssel water
Fresh water
Water supply for Agriculture
Leeuwarden
Groningen
Assen
ZUYDER ZEE WORKS
IJSSEL-MEER
Zaanstad
Zwolle
Haarlem
Amsterdam
IJssel
A
B
Apeldoorn
Enschede
Leiden
Utrecht
RHINE CANALISATION
Den Haag
Rotterdam
Lek
Nederrijn
Arnhem
DELTA WORKS
Waal
Dordrecht
Nijmegen
Rijn
's-Hertogenbosch
Breda
Middelburg
Tilburg
Eindhoven
Maas
Maastricht
0 10 20 30 40 50 60 70 80 km
0 10 20 30 40 50 Miles
(1978)
Dunes
Polders
High Netherlands
A
Sea Level
B
Fresh
Salt
Brackish
Fresh
High Sandy Soils
Ground water-table

Demography

Population growth

Since 1830, when the first census was taken, the population of the Netherlands has increased more than five times, from 2.6 million to 13.9 million on 1st January 1978. Until recently immigration had only a small effect on this increase and the growth has largely to be attributed to natural increase. The graph shows the movement of birth and death rates since 1900. The birth rate fell from 31.6 per thousand in 1900 to 12.5 per thousand in 1977, mainly because of the fall in fertility in marriage. The death rate declined from 17.9 per thousand in 1900 to 7.9 per thousand in 1977, thanks to the improvement in medical care and social and hygienic conditions, as a result of which infant mortality, in particular, was reduced. Marked temporary increases in the death and birth rates during and immediately after the two world wars do show up in the graph, but are not considered further here.

During the 1960's the death rate showed a slight increase as a result of the relative growth in the numbers of people in the highest age groups. The convergence of the birth and death curves reflects the fact that, since about 1960, the natural increase has greatly declined. In 1960, the Netherlands, with a natural increase of about 13 per thousand – about the same as in 1900! – had by far the most rapidly growing population in Western Europe. Subsequently, the natural increase fell to 4.6 per thousand in 1977. Incidentally, this decline has been partly compensated since the end of the 1960's by an increase in immigration, caused mainly by the arrival of workers from the Mediterranean countries and from Surinam, which became independent in 1975. In 1977 the immigration gain amounted to 22,800 persons, i.e. 1.7 per thousand. Mainly because of the continuing decline in the birth rate the official estimate for the population of the Netherlands in the year 2000 has changed in scarcely ten years from 20 million to 14 or 15 million.

Age structure

After the total number of inhabitants, the structure of the population is of importance. Mainly because of the effect of the Second World War on the birth and death rates, the population pyramid (1976) shows a somewhat unbalanced structure. The 30-45 age group is rather weakly represented, while the post-war bulge in the birth rate is reflected in a large 25-30 group.

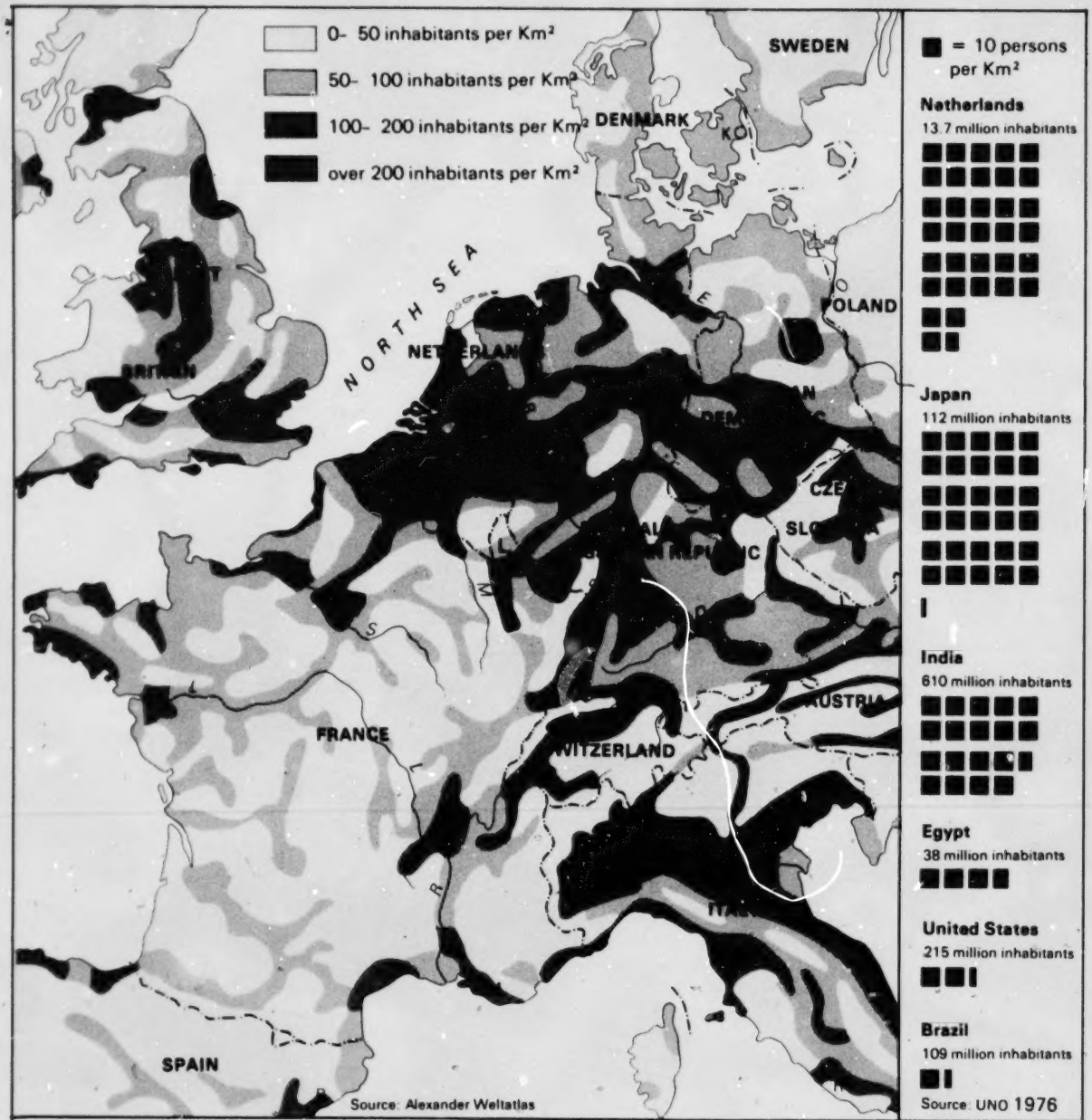
There is also a relatively large group of old people. On 1st January 1978, 11.1 per thousand of the population was 65 years or older. The average life expectancy at birth has increased from c.37 years in 1850 (high infant mortality) to nearly 75 years at present.

Population density

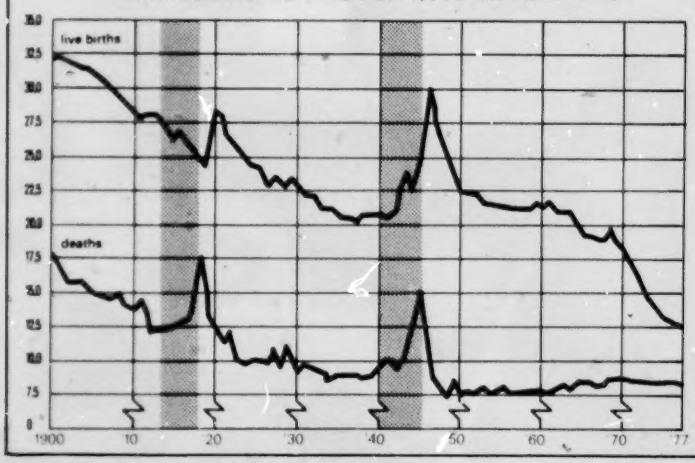
With an average of 411 inhabitants per square kilometre of land[1] (1st January 1978) the Netherlands is the most densely populated country in Europe. The map shows that, in this respect, the country forms an entity with other densely populated areas in Western Europe. Reference has already been made to the favourable situation of the country on the North Sea and at the mouth of important rivers. By making use of the possibilities this situation affords for commerce and industry, the Netherlands in spite of its high population density, enjoys a high level of prosperity.

For purposes of comparison the population density of five other countries is given. To answer the question whether a country is overpopulated or not, not only should the number of inhabitants per square kilometre be taken into consideration, but also the extent to which economic resources are present and exploited. There is no question of the Netherlands being overpopulated in the economic sense, but one may speak of territorial overpopulation, which is reflected in problems in the field of recreation space, traffic, environmental pollution, etc.

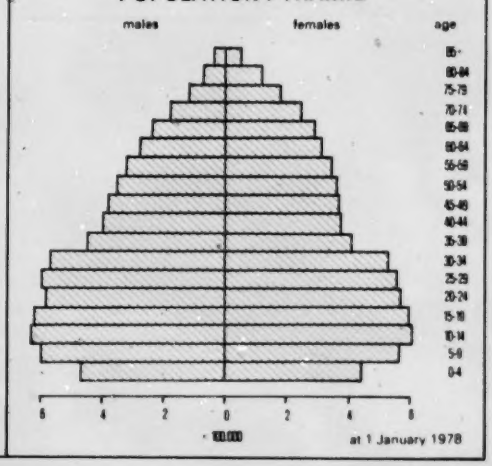
[1] This calculation is based on the true land area, i.e. excluding waters wider than 6 metres, which amounts to 33,810 km². If the area incorporated into municipalities (36,948 km²) is taken as a basis, the density is 376 per km². If the total area – including estuaries, territorial waters, etc., amounting to 41,160 km² – is taken as a basis, the population density is 338 persons per km².



BIRTHS AND DEATHS PER 1,000 INHABITANTS



POPULATION PYRAMID



Distribution of the Population

Regional distribution

The Dutch population is not evenly distributed over the country. On the page opposite it will be seen (top right) that nearly a half of the total population lives in the three western provinces, while the remaining eight provinces, which account for 79% of the area, accommodate only a little more than half of the population. The most densely populated province is South Holland, with 1,064 inhabitants per square kilometre of land, and the most thinly populated Drente, with 156 per square kilometre (1st January 1978).

It is not the regional differences in *natural rate of growth* which are the cause of this uneven distribution, but much more the greatly varying economic possibilities in the regions and the *migration flows* to which they give rise. Traditionally, the western provinces, situated on the sea and rivers, have afforded the best opportunities for a prosperous economic development. For many years during the 19th and the first half of the 20th century the consequence of this was an internal migration flow directed towards the rapidly growing port and industrial cities of the west and originating from the agricultural areas in the remainder of the Netherlands.

Statistics:
the table below shows for the provinces and the five regions of the country the area, population, population density and growth during a 5-year period.

	land area sq. km.[1]	population x 1000	pop. per sq. km. of land	% growth 1.1.73 to 1.1.78
	1.1.78	1.1.78	1.1.78	
Groningen	2330	548	235	3.4
Friesland	3340	573	172	6.3
Drente	2645	413	156	7.0
North Netherlands	**8315**	**1534**	**184**	**5.4**
Overijssel	3804	1001	263	4.7
Gelderland	5010	1668	333	5.6
S. IJsselmeer Polders	961	49	51	122.7
Eastern Netherlands	**9775**	**2718**	**278**	**6.3**
Utrecht	1328	879	662	4.9
North Holland	2656	2300	866	0.7
South Holland	2869	3053	1064	1.1
Western Netherlands	**6853**	**6231**	**909**	**1.5**
Zeeland	1790	340	190	6.6
South West Netherlands	**1790**	**340**	**190**	**6.6**
North Brabant	4911	2012	410	7.0
Limburg	2166	1061	490	3.0
South Netherlands	**7078**	**3073**	**434**	**5.6**
NETHERLANDS[2]	33810	13898	411	3.8

[1] area excl. waters wider than 6 metres.
[2] population of the Netherlands including people with no fixed address entered in the Central Population Register.

Changed migration pattern

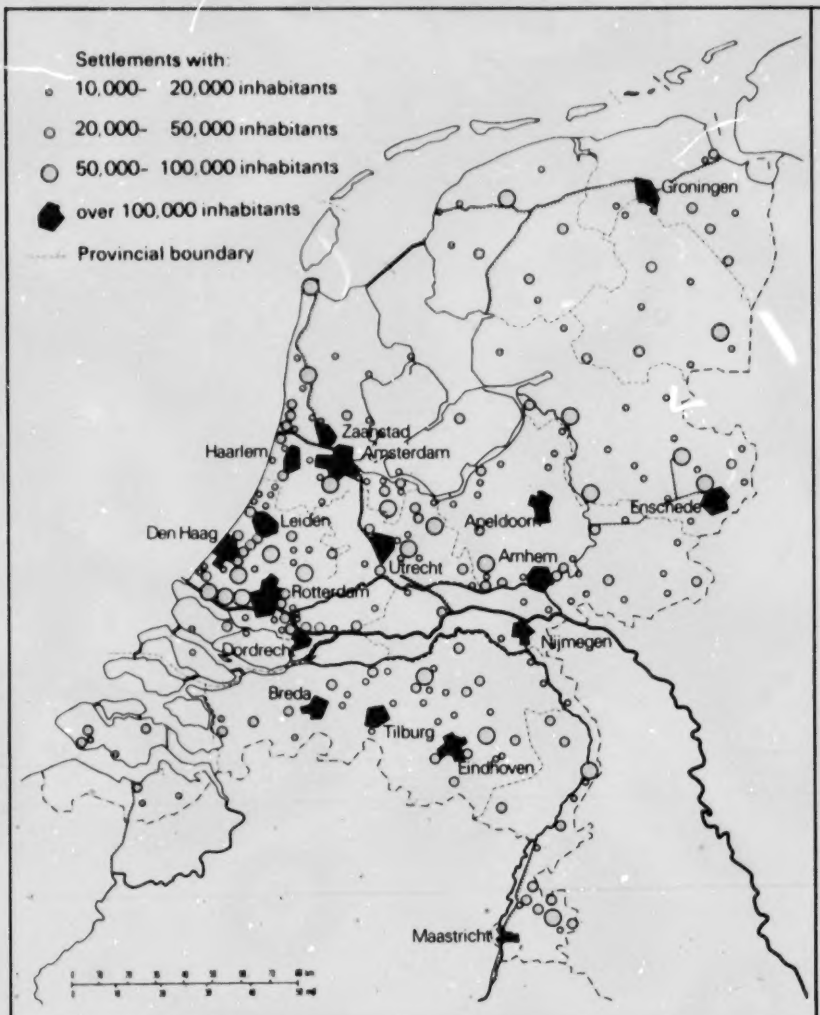
The map at bottom left on the opposite page shows that the migration pattern described above still held during the 1950's. Particularly in the northern provinces there was a net migration loss. The migration gain in the west was balanced by high emigration to Anglo-Saxon immigration countries such as Canada and Australia. The adjoining map shows for the first half of the 1970's a picture which is completely the opposite in almost every respect. The north and south-west have a small internal migration gain and the eastern and southern provinces a very large one, while the west has become an area of internal migration loss. Again, this is compensated by foreign migration, which now, particularly in the west, shows a considerable gain (see p. 18). The explanation for these drastic changes, although complex, is found largely in the following factors. The migration from the west to the north is partly the consequence of the government's dispersal policy (see also p. 30).

The movement from the west to the southern and eastern regions of the country can largely be seen as an expansion of the Randstad (see also p. 22). The transformation of the South West Netherlands from an emigration to an immigration region is mainly the consequence of better accessibility as a result of the execution of the Delta works (increased establishment of industry and commuting, pp. 14-15). Lastly, the extensive foreign immigration consists predominantly of 'temporary' workers from the Mediterranean countries and, during the years 1970 to 1975, of people from Surinam.

Urbanisation and suburbanisation

The pattern of internal migration, as it existed until about 1960, had largely the character of a movement to the cities. As the population grew and, at the same time, agriculture became increasingly mechanised, people left the countryside to find a livelihood in the town. At first, it was mainly the large cities in the west which grew as a result of this, but later the medium-sized towns in the east and south were affected as well.

After 1960 important changes occurred. In the town centres many dwellings were demolished to make way for shops, offices, roads, etc. The density of new development was usually lower than that of the old and the average dwelling occupancy also fell. As a result of all this the population of the large cities and, after some time, also that of their agglomerations began to fall. Many people left the cities and settled in smaller places, attracted by a better residential environment and enabled to do so by their greatly increased mobility. Generally, they continued to work in the city, so that this suburbanisation brought with it a great increase in commuting.



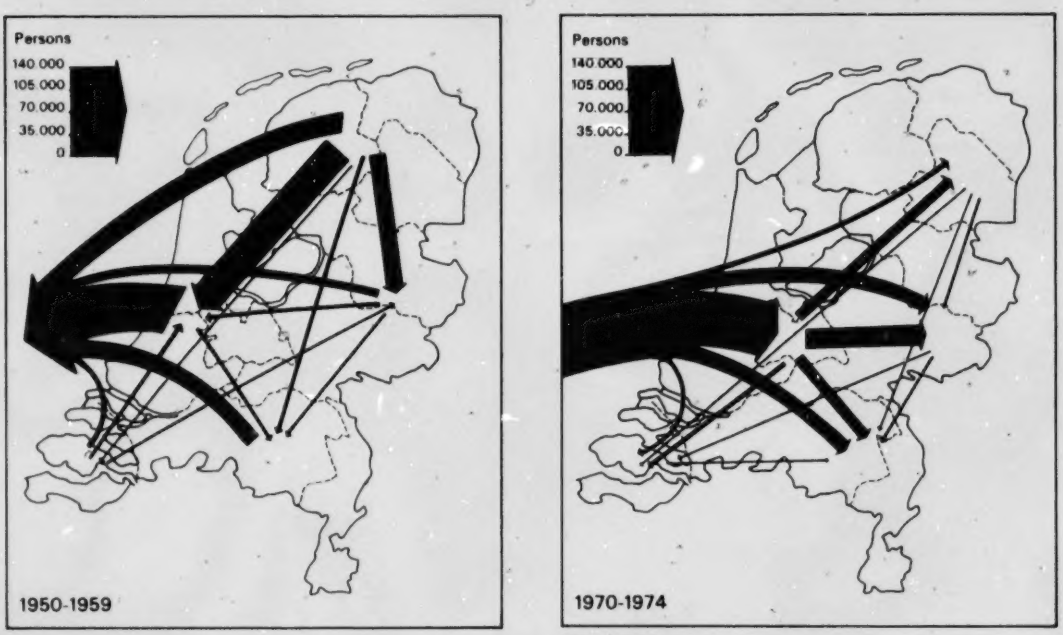
DISTRIBUTION OF AREA AND POPULATION, WESTERN VERSUS REMAINING PROVINCES, 1 January 1978.

Area

NOORD-HOLLAND UTRECHT ZUID-HOLLAND	FRIESLAND GRONINGEN DRENTE OVERIJSSEL GELDERLAND ZEELAND NOORD-BRABANT LIMBURG
21%	79%

Population

NOORD-HOLLAND UTRECHT ZUID-HOLLAND	FRIESLAND GRONINGEN DRENTE OVERIJSSEL GELDERLAND ZEELAND NOORD-BRABANT LIMBURG
45%	55%



Internal and overseas migration, persons

The Randstad

Origin

Through a concurrence of natural and economic historical circumstances the major cities of the Western Netherlands have evolved into an approximately horseshoe-shaped belt, situated around a more agricultural central zone. The two maps show how, over a period of more than a century the towns and villages have grown towards each other, so that planners have gradually come to view them as an entity – the 'Randstad Holland'.

The cities nevertheless retained their individual identity, both in respect of their physical pattern and of their function, character and the way they are experienced by their inhabitants. An essential difference between the Randstad and London or Paris, for example, is that, in the Randstad, the traditional functions of a metropolis, such as administration, industry and services, are not concentrated in one centre, but are distributed over a number of towns. The bar diagram shows that the share of the Randstad in the total population of the Netherlands has increased considerably since the last century.

As early as the 17th century our cities stood out which were later to become the principal nuclei of the Randstad. They were Amsterdam, The Hague, Rotterdam and Utrecht. Amsterdam and Rotterdam – each in its own way – owe their origin and growth, in part, to their special situation. They have long formed points of entry to the European hinterland and accordingly developed mainly as trade and industrial centres. The Hague is the national centre of government (while Amsterdam is the capital of the country). Utrecht, situated in the centre of the country, forms a junction of road and rail links between the different regions of the Netherlands and derives from this a function as a centre for trade fairs, conferences, etc.

Spatial overpopulation

Many of the problems in the Randstad stem from the spatial overpopulation in the conurbations, which threaten in various ways to cause damage to the residential environment. Many towns have to contend with both quantitative and qualitative housing problems. Because of a fall in the average dwelling occupancy the need for residential space increases even if the population ceases to grow.

The great increase in the number of commuters is giving rise to great traffic problems, particularly during the rush-hours.

There is a great lack of recreational space in and around the Randstad (the agricultural polder landscape of the 'Green Heart' – apart from the lakes – does not lend itself to mass recreation) and the damage to the environment (water, air, soil and noise pollution) is becoming serious in some areas. In addition, the 'Green Heart' itself is being threatened by suburbanisation – both of residence (see p. 20) and of activities in the secondary and tertiary sectors – by the construction of roads, the building of second homes etc. The population density in the 'Green Heart' is already the same as the national average.

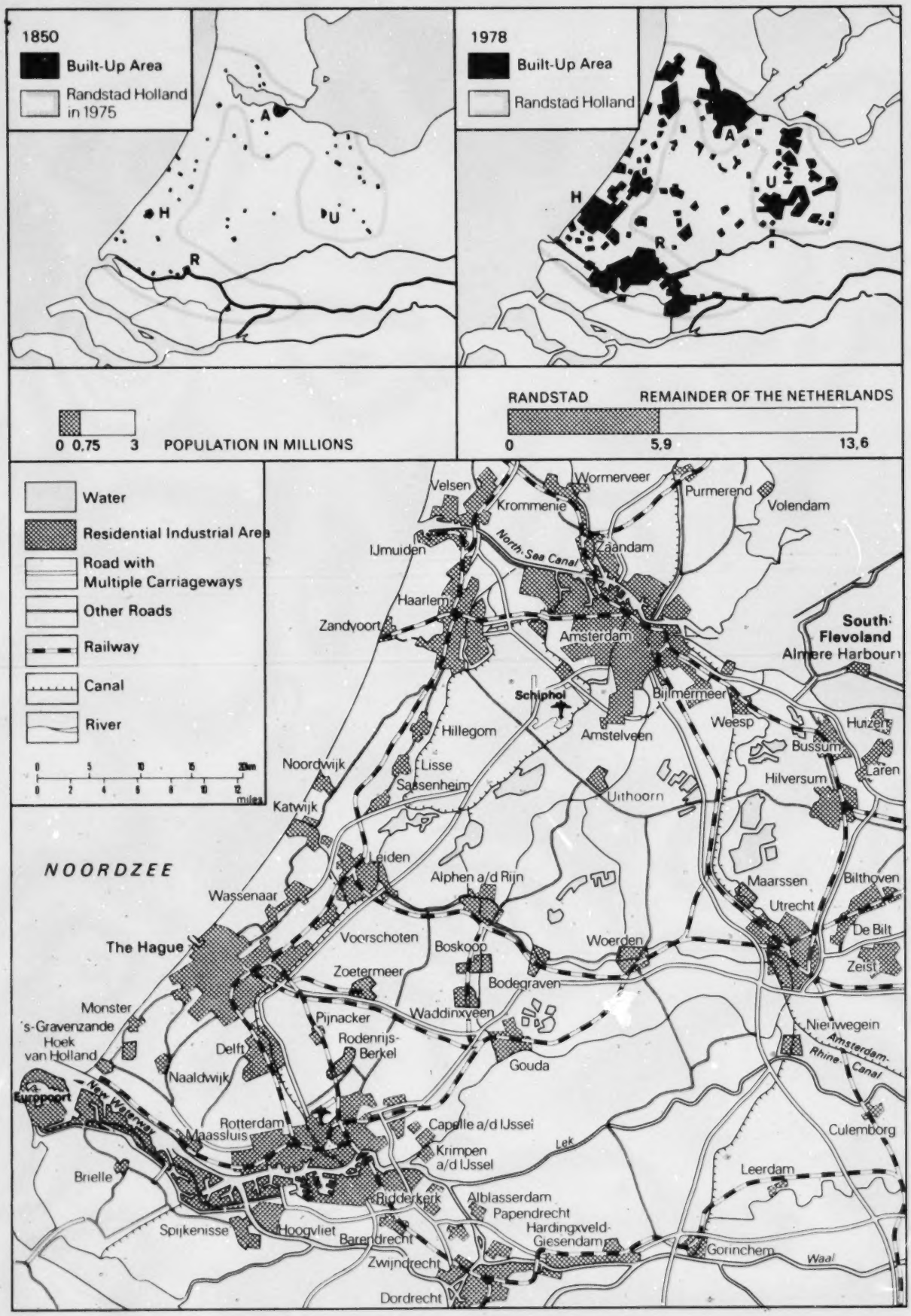
Further growth

The objectives of the policy for the Randstad and its place in the physical planning of the Netherlands as a whole were considerably changed at the beginning of the 1970's. Before then (see Tweede Nota Ruimtelijke Ordening (Second Report on Physical Planning in the Netherlands), 1966, p. 38) the first objective was to restrain the growth of the Randstad as far as possible by means of a national dispersal policy. To the extent that this was not possible, the growth had to take place outwards – to the North, East and South.

During the 1970's, however, (Derde Nota Ruimtelijke Ordening (Third Report on Physical Planning), 1974 *et seq.*), there proved to have been such a large degree of spontaneous migration from the urban ring that the strict dispersal policy was partly abandoned. It was feared that the Randstad would be weakened nationally and internationally if the exploitation of the obvious locational advantages continued to be restrained. By concentrating attention more than previously on urban renewal and through the creation of high quality urban dwelling forms an attempt is now being made to slow down migration from the Randstad.

The approach to the outward directed growth is now also a more discriminating one. The principle remains, but there are exceptions; in areas of vulnerable landscape or which are already densely populated, growth is to be restrained. In other overspill areas, such as North Holland north of Amsterdam, the Southern IJsselmeer Polders and Western North Brabant, the growth is to be concentrated in a limited number of growth towns and nuclei.

The concern for retaining an open Green Heart remains, although local concessions have had to be made, such as at Zoetermeer east of The Hague and along the eastern rail line between The Hague and Rotterdam.


1850
Built-Up Area
Randstad Holland in 1975
1978
Built-Up Area
Randstad Holland
A
H
U
R
0 0,75 3 POPULATION IN MILLIONS
RANDSTAD
REMAINDER OF THE NETHERLANDS
0 5,9 13,6
Water
Residential Industrial Area
Road with Multiple Carriageways
Other Roads
Railway
Canal
River
miles
NOORDZEE
Velsen
Wormerveer
Purmerend
Volendam
Krommenie
IJmuiden
North Sea Canal
Zaandam
Haarlem
Zandvoort
Amsterdam
South Flevoland
Almere Harbour
Schiphol
Bijlmermeer
Hillegom
Amstelveen
Weesp
Hilversum
Noordwijk
Lisse
Sassenheim
Katwijk
Leiden
Alphen a/d Rijn
Wassenaar
The Hague
Voorschoten
Boskoop
Woerden
Zoetermeer
Bodegraven
Monster
's-Gravenzande
Hoek van Holland
Pijnacker
Waddinxveen
Rodenrijs
Berkel
Delft
Gouda
Naaldwijk
Europoort
New Waterway
Rotterdam
Maassluis
Capelle a/d IJssel
Krimpen a/d IJssel
Lek
Brielle
Ridderkerk
Alblasserdam
Papendrecht
Spijkenisse
Hoogvliet
Barendrecht
Hardinxveld-Giesendam
Zwijndrecht
Dordrecht
Gorinchem
Waal
Nieuwegein
Amsterdam-Rhine-Canal
Culemborg
Leerdam
Maarssen
Bilthoven
Utrecht
De Bilt
Zeist
Uithoorn
Bussum
Laren

The Economy

International character

The economy of the Netherlands has long had a strong international orientation. In the introduction to this booklet reference was already made in this connection to the great importance of the favourable situation of the country from the traffic point of view. Fisheries and shipping encouraged the rise of foreign commerce and industry.

During the past hundred years a further factor has come to play an increasingly important part. The country has become progressively more densely populated and is, moreover, relatively poor in natural resources. The logical consequence of this has been a great rise in the volume of imports. To ensure a favourable balance of payments an extensive export of goods and services is equally important. Until about 1970 it was never possible to match the value of the imported goods with that of the exports. Attempts were made with varying success to maintain a stable balance of payments by means of a surplus on the services account (invisible exports).

From 1970 a positive turn was given by the large export of natural gas, but this is temporary in character.

The dependence on foreign trade makes the Netherlands an advocate of international economic co-operation (Benelux, EEC), although its disadvantages, in the shape of enhanced foreign competition, also make themselves clearly felt.

Occupied population and employment

The division of the occupied population over the different sectors of the economy has changed since 1900 in a way which is characteristic of all the industrialised countries. Certain clear stages may be observed, as appears from the divided circle diagrams on the opposite page.

1. In 1900, the agricultural, manufacturing and services sectors each comprised about one third of the occupied population.
2. In 1950 the share of the agricultural sector had greatly declined and that of the manufacturing sector greatly increased (cf. also the absolute figures, plotted in the bar charts).
3. In 1975 the decline in the agricultural sector is shown to have continued still further. Economies of scale, mechanisation and loss of agricultural land to other uses are largely responsible.

A striking feature is that the proportion and absolute number of those working in the manufacturing sector have now also declined markedly. Different factors play a part here, such as the market at home and abroad, continuing mechanisation and automation, saturation of particular markets and the stagnation of economic development from about 1973. The shift of emphasis to the services sector is clearly shown.

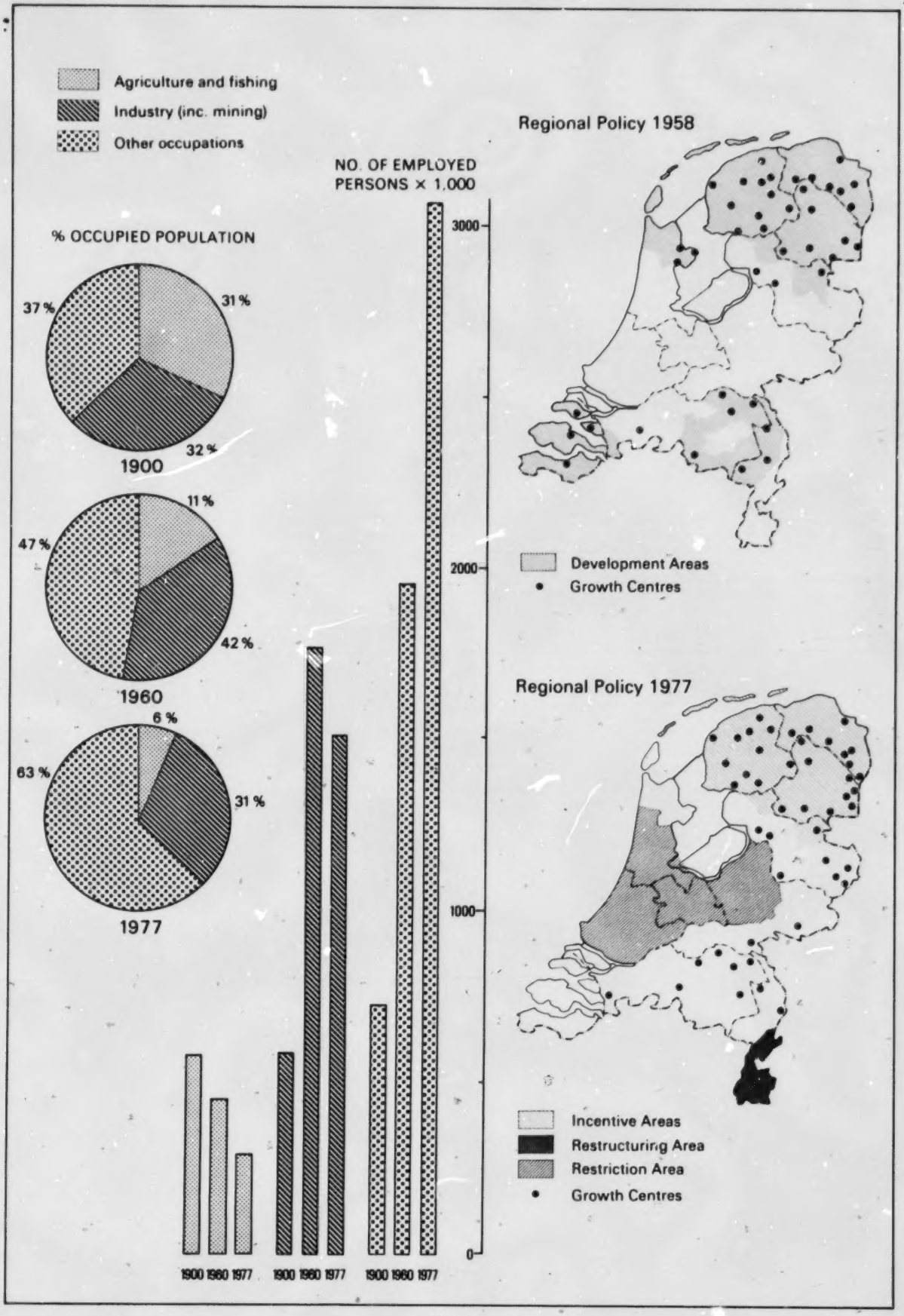
During the course of the 1970's the rate of unemployment has grown. It must be assumed that this is not only the result of the temporary stagnation in the economy; there is also a considerable amount of structural employment arising, for example, from the processes of automation and economies of scale referred to above. These have led to an increase in labour productivity, but employment has been reduced, although there are marked differences between industries and in respect of degree of skill. A shortage of less skilled labour caused the immigration of tens of thousands of workers from the Mediterranean countries.

Regional differences

In order to remove undesirable regional differences in employment and income structure the government has been pursuing a socio-economic dispersal policy since the 1950's. In 1958 our 'problem regions' were designated (see map top right), characterised by a decline in agricultural employment and a lack of alternatives, resulting in the emigration of people to other regions or to other countries. In these problem regions the establishment of firms, particularly in the manufacturing sector, was encouraged by means of financial and other measures. They were called 'stimuleringsgebieden' (development areas).

Since then the policy has undergone a number of radical changes (see map bottom right). A number of areas could be removed from the list, such as Zeeland, which is now better served by roads. Only the North East remained as a development area. In addition, a number of places in the Eastern and Southern Netherlands were designated, where subsidies were made available to counter the consequences of the decline in the textile industry.

Two other kinds of problem area have been added. These are South Limburg as a 'restructuring area' and the Western provinces as a 'restraint area'. In Limburg all the coal mines were closed between 1966 and 1975 (see also pp. 28-29), so that the already existing industrial structure had to be adjusted (expansion of existing industries and establishment of new ones, retraining of miners). In the West there was a need to be able to prevent the establishment of new industries because of the lack of space or the damage they would cause to the environment. In the development and restructuring areas emphasis is now also being placed on the encouragement of activities in the services sector, with the government setting an example by the relocation of some of its own activities.


Agriculture and fishing
Industry (inc. mining)
Other occupations
% OCCUPIED POPULATION
37 %
31 %
32 %
1900
47 %
11 %
42 %
1960
63 %
6 %
31 %
1977
NO. OF EMPLOYED PERSONS × 1,000
3000
2000
1000
0
1900 1960 1977
1900 1960 1977
1900 1960 1977
Regional Policy 1958
Development Areas
Growth Centres
Regional Policy 1977
Incentive Areas
Restructuring Area
Restriction Area
Growth Centres

Agriculture

Land use

As the bar chart shows, about 70% of the area of the Netherlands consists of cultivated land and nearly two thirds of this is grassland. Woods, heaths etc., together account for no more than 13% of the Dutch land area. Both the cultivated and the natural areas are constantly decreasing in extent, because of the rapid increase in the area occupied by roads and buildings.

	1950	1976
Land use as % of cultivated land:		
arable	39.5	33
horticulture	4.1	5.5
grass	56.4	61.5
Productivity:		
av. milk yield per cow in kg.	3800	4725
tonnes of potatoes per ha.	25	33
Av. farm size in hectares	6.9	13.1
Employment in agriculture x 1,000	533 (1947)	295
idem as % of occupied population	19.8 (1947)	6.1

Agricultural regions

The map shows the regional distribution of the different forms of agricultural land use. The regional diversity can be explained mainly by reference to such factors as nature of the soil and water economy.

Arable farming is found mainly on fertile, well-drained marine clays, such as occur in the north and south-west of the Netherlands, in the drained lakes of North and South Holland, and the IJsselmeer Polders. The most important crops grown are cereals, potatoes and sugar beet. By Dutch standards the farms are quite large (average 45 ha) and highly mechanised. The production of bread grains is not sufficient for home consumption, about half of which is supplied from imported wheat. Arable farming also predominates in the 'peat colonies' of SE Groningen and E. Drente.

Livestock farming occurs mainly on the less well-drained clay and peat soils, where the ground is mostly too soggy for arable farming. Here cattle farming predominates, with milk (for home consumption) and dairy products (partly for export) as the main products. Mixed farms are traditional on the sandy soils of the eastern and southern Netherlands, although the emphasis is being placed increasingly on livestock farming. Arable and livestock farming are being increasingly dissociated on these holdings. Many small farms have begun to specialise in pig and poultry farming (factory farming). Since increasing use is being made of mixed feeds in all the livestock areas, this has given rise to an industry which has grown rapidly and imports large quantities of fodder grains.

Horticulture is practised in many areas. Its regional distribution is explained by both physical and economic factors (domestic and foreign markets). Behind the dunes south of Haarlem are the famous bulbfields. Along the rivers there are many orchards (the Betuwe). In other areas shown on the map many kinds of vegetables, fruit, flowers and plants are produced. Salad crops – tomatoes, cucumbers and lettuce – are particularly important and a considerable part of them are grown in heated glasshouses, mainly in the Westland, south of The Hague. Many horticultural products are exported; fruit and vegetables, for example, are sold to the Rhine and Ruhr regions of Germany.

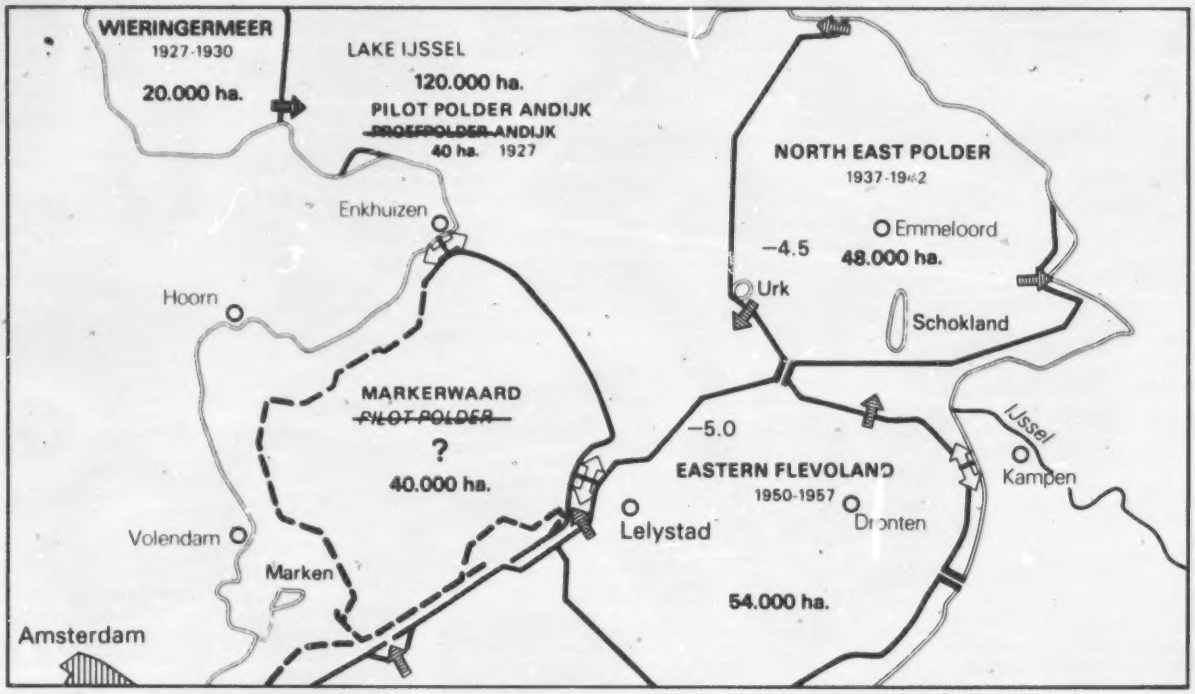
Importance of agriculture

The role played by the agricultural sector in the Dutch economy has greatly changed during the past century. When Dutch agriculture was confronted with the import of cheap agricultural products from overseas at the end of the 19th century, such as grain from North America, a process of adjustments set in, which is really still continuing. The process involves the reduction or abandonment of the growing of crops which can be produced more cheaply abroad, and specialisation in high-value products which can also be exported. The result is that some 20 to 25% of the Dutch export trade consists of processed or unprocessed agricultural products, the value of which greatly exceeds that of the agricultural imports. There has been a continuing effort to increase production, both per hectare and per worker. The many land consolidation schemes, which have been or are being carried out throughout the country, must also be viewed in this light. Their effect is to increase the size of holdings and parcels and to reduce the number of people employed in farming. The aim is to achieve savings in costs through efficient farming practice. This is the only way in which Dutch agriculture can continue to play an important role, in the EEC, as in other contexts.

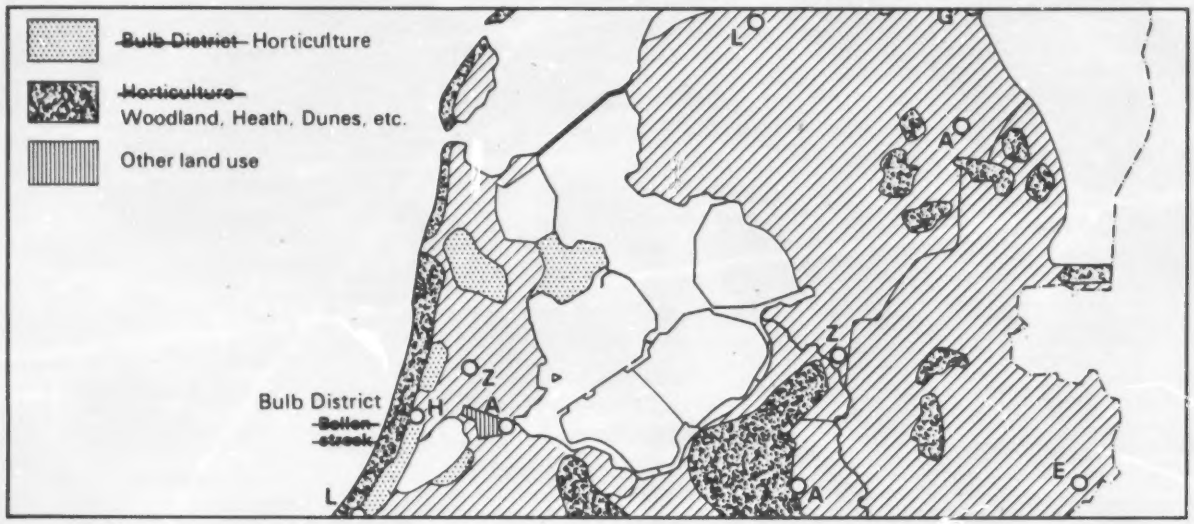
The figures in the table above illustrate the developments described above, such as specialisation (relatively larger areas for grass and horticulture) increased productivity, increase of average farm size and reduction of employment in agriculture both in absolute and relative terms.

ERRATA

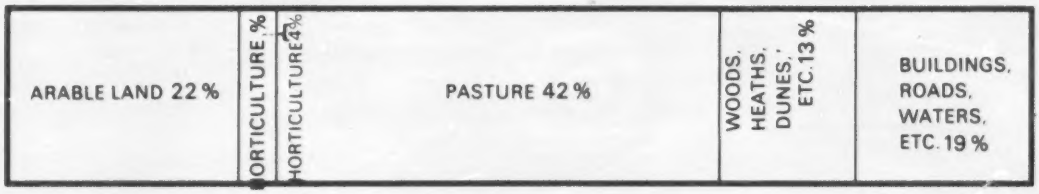
page 13



page 27



LAND USE IN THE NETHERLANDS



1976

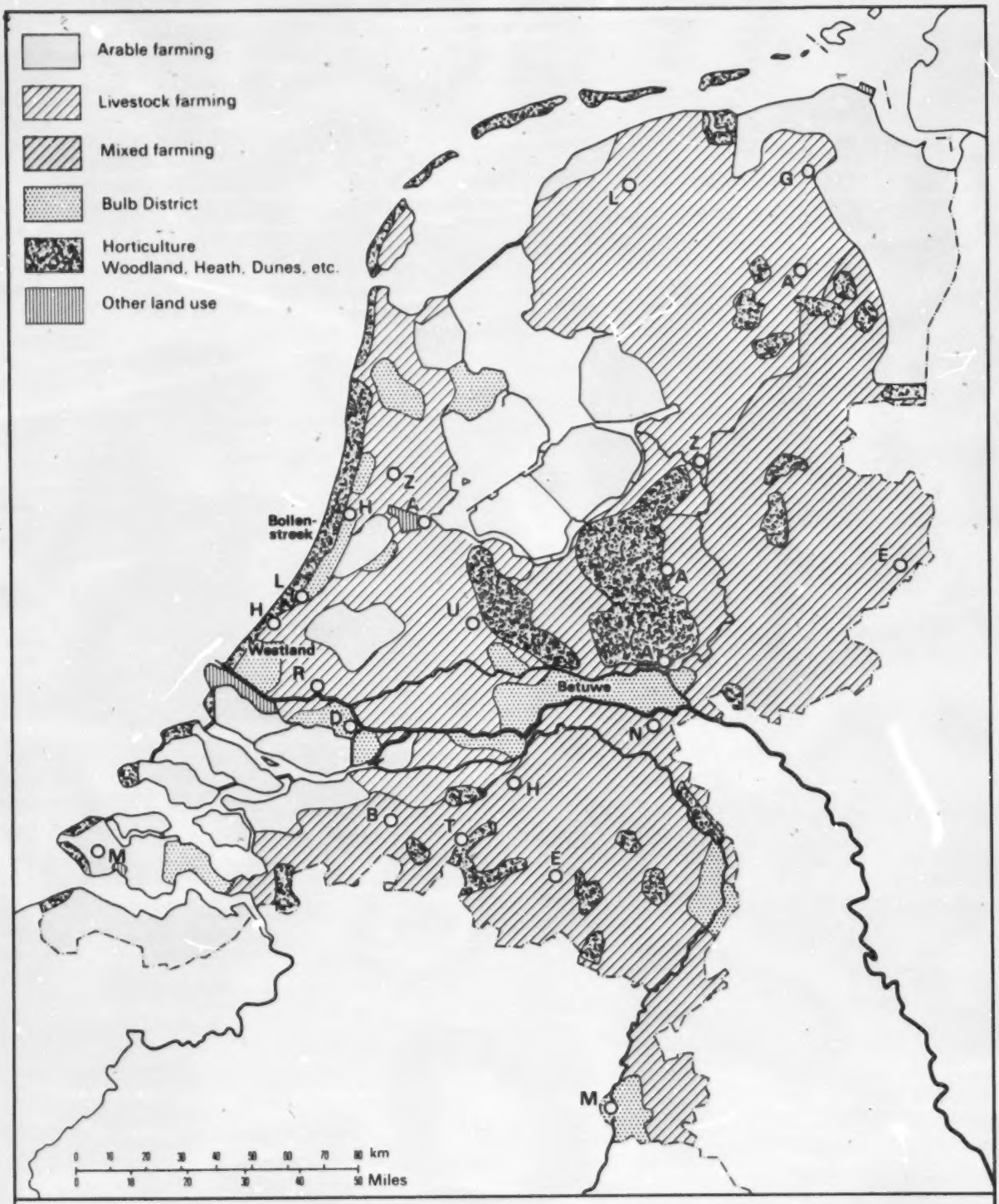
page 18:

Second column, 5th line:
On 1st January 1978 11.1 per thousand of the population was 65 years or older.
Should be: 11.1 per cent.

p.t.o.

This booklet gives distances in kilometres, and heights in metres and centimetres. The following tables may be used for conversion to miles, feet and inches.

cm	inches	m	ft	km	miles
1	0.39	1	3.28	1	0.62
5	1.97	2	6.56	2	1.24
10	3.94	3	9.84	3	1.86
25	9.84	4	13.12	4	2.49
50	19.69	5	16.40	5	3.11
100 =		10	32.81	6	3.73
1 m.	39.37	25	82.02	7	4.35
		50	164.04	8	4.97
		100	328.08	9	5.59
		1000 =		10	6.21
		1 km.	3280.80	15	9.32
				20	12.43
				25	15.54
				50	31.07
				100	62.15
				etc.	



LAND USE IN THE NETHERLANDS

ARABLE LAND 22 %	HORTICULTURE %	PASTURE 42 %	WOODS, HEATHS, DUNES, ETC. 13 %	BUILDINGS, ROADS, WATERS, ETC. 19 %

1976

Mineral Production

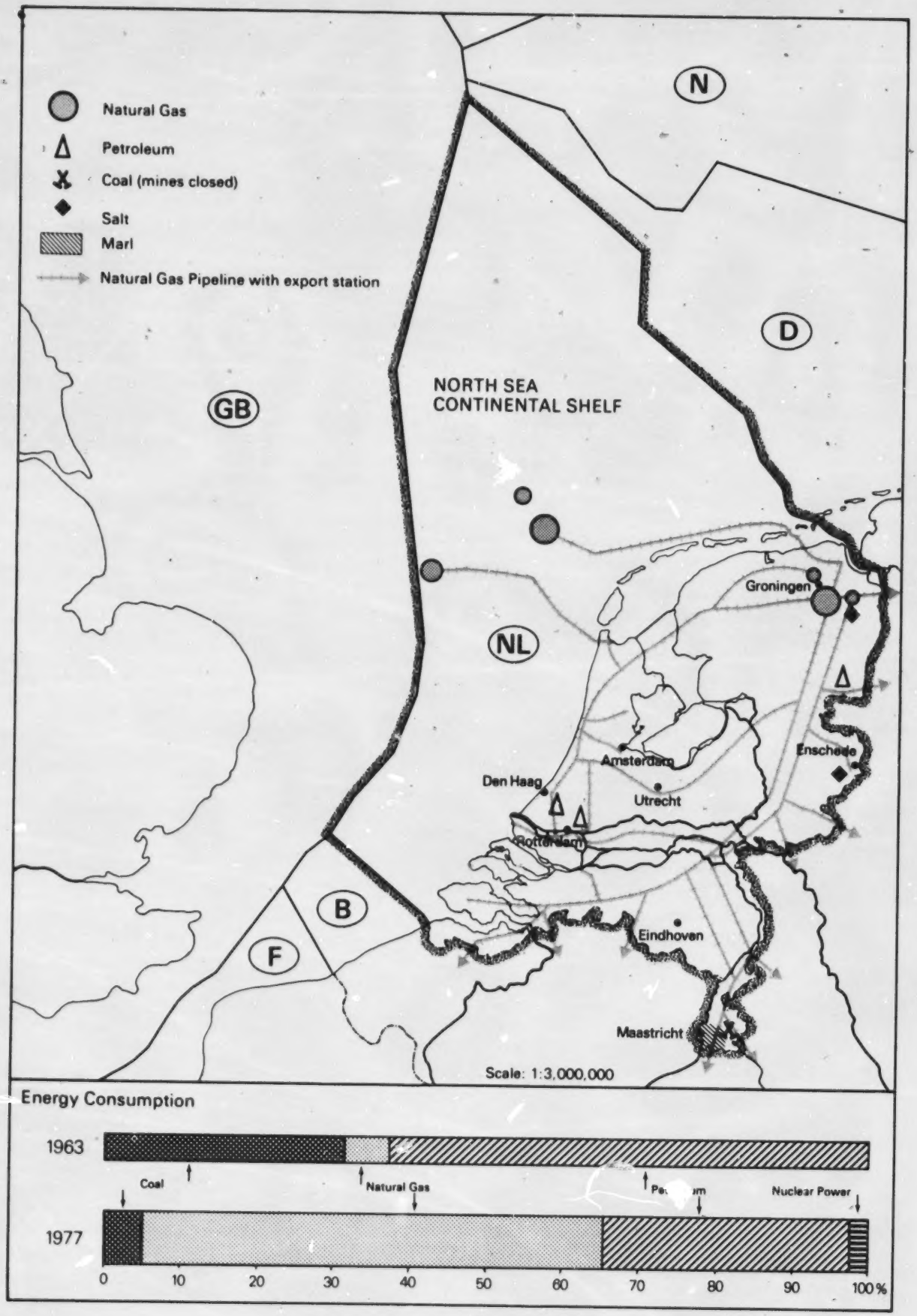
History
Until late in the 19th century it was thought that the subsoil of the Netherlands was poor in minerals, although it was already known that South Limburg was underlain by coal and marl, but the State and private enterprise showed little interest in exploitation in this remote and, at that time, inaccessible part of the country.

Coal
Around the turn of the century, when the need for industrialisation became evident, there was a growing interest in the coal and exploitation began with the sinking of twelve mines, at first with private and, later, with state capital. At depths down to 1,000 metres both domestic and industrial coals were mined. After 1960 – the year in which great reserves of natural gas were discovered beneath the Netherlands – coal mining proved to be no longer economic and, between 1966 and 1975, exploitation ceased in all the mines. Miners, retrained as industrial workers, have found employment partly in the existing chemical industry (originally based on the processing of coke-oven gas, but now converted to oil and natural gas) and in newly established industries. The coal still required, including that for blast furnaces, is now imported.
The table below, giving the total Dutch energy consumption in percentages, shows how coal has been ousted by natural gas, which can be produced and transported much more cheaply, is more economical to use and causes less air pollution (see also the bar chart).

Energy consumption, in %	1963	1977
Coal	44	5
Natural gas	2	54
Petroleum	54	37
Nuclear energy	0	4
Index total consumption (1960 = 100)	126	287

Natural gas
In 1960 one of the largest natural gas fields in the world was discovered under the North Netherlands. During the 1960's a distribution grid was laid over the whole country, with extensions over the frontiers, so that natural gas from the Netherlands is also used in the German Federal Republic, Belgium, France and Italy. The volume of gas exported is increasing both absolutely and relative to the total extracted. Since 1974 more than half of the gas produced has been sold each year to other countries (1976: 56% of the production of 96.9 x 10^9 cu.m). More than half of what remains goes to gas and electricity supply companies and to industry, and the rest to domestic use. Since the energy crisis of 1973-74 it has been official policy to restrict both exports and consumption by industry and energy supply companies in order to be able to supply the small consumers with gas for as long as possible. The reserves are now estimated at 1800 x 10^9 cu.m.

Other minerals
Petroleum, the third mineral which may be used as fuel and as a raw material for the chemical industry, also occurs in the Netherlands. The quantities, however, are very limited. Extraction is carried on in south-east Drente and the area between Rotterdam and The Hague. The refineries in the port district of Rotterdam, which is one of the largest refining centres of Europe, process mainly imported oil (mostly from the Middle East). Petroleum and natural gas have also been discovered at a few sites in the part of the North Sea allocated to the Netherlands in the Treaty of Geneva in 1958, for the exploration and exploitation of minerals.
Common salt is pumped up in large quantities as brine in the eastern and north-eastern Netherlands. It is processed at Hengelo and Delfzijl.
Surface minerals have been exploited for centuries. The marl of South Limburg was formerly used as a building stone; it is now also used for the manufacture of cement and calcareous fertiliser. Peat, which was formerly important as a fuel, is now dug only in south-east Drente and used partly for soil improvement in horticulture. Clay, sand and gravel are used in the production of building materials, such as bricks, roof-tiles and concrete.


Natural Gas
Petroleum
Coal (mines closed)
Salt
Marl
Natural Gas Pipeline with export station
N
D
GB
NL
B
F
NORTH SEA
CONTINENTAL SHELF
Groningen
Enschede
Amsterdam
Den Haag
Utrecht
Rotterdam
Eindhoven
Maastricht
Scale: 1:3,000,000
Energy Consumption
1963
1977
Coal
Natural Gas
Nuclear Power
0
10
20
30
40
50
60
70
80
90
100%

Industry I

Introduction
On page 24, reference is made to the international orientation of the Dutch economy as a whole. This is certainly true of Dutch industry, the development of which is due much more to the situation of the country in relation to route-ways than to the presence of large reserves of raw materials and fuels. The traditionally important foreign trade and shipping encouraged the growth of shipbuilding and the processing of imported raw materials.

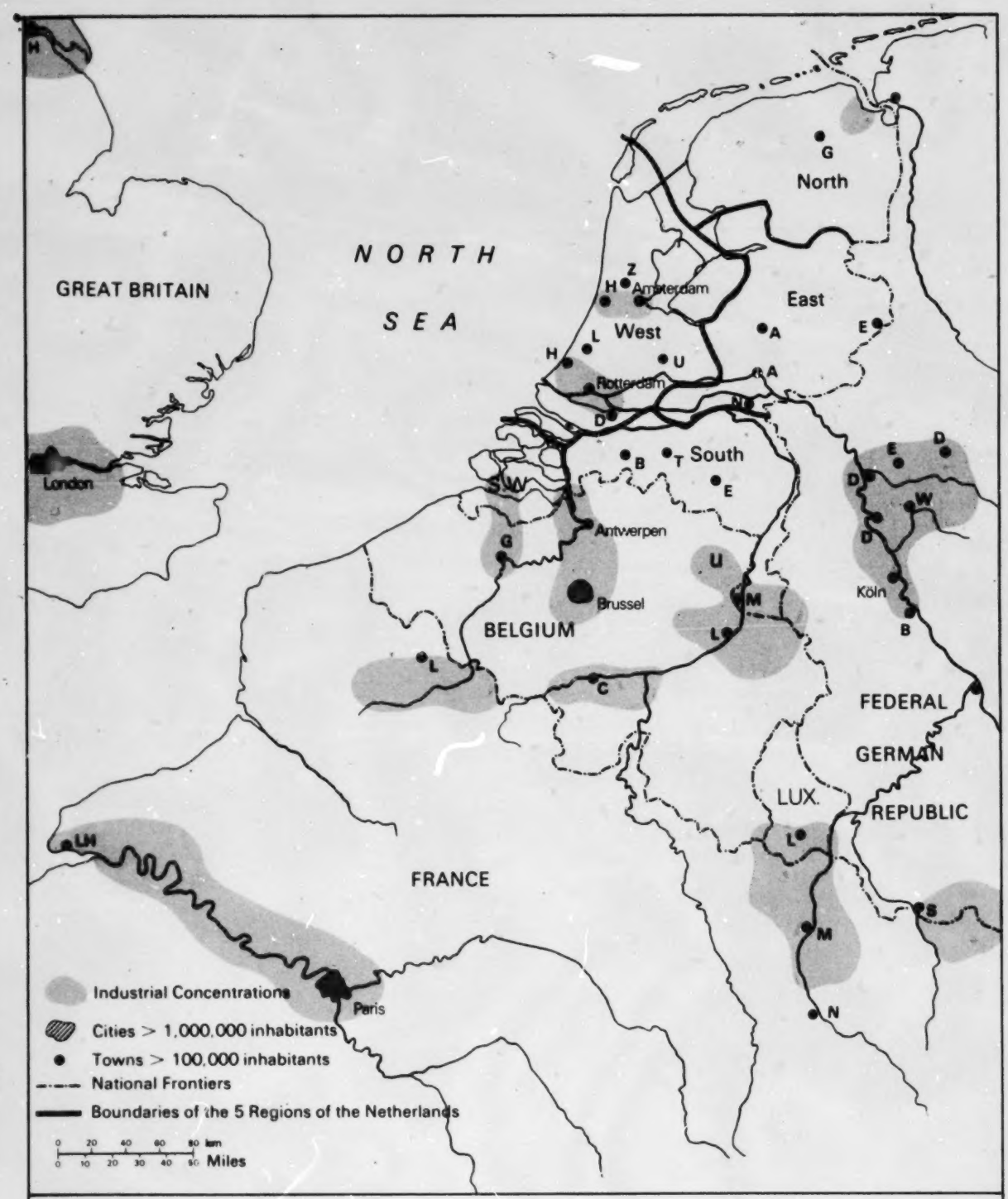
History up to 1900
There were already industries in the Netherlands in the 17th century, mainly in the form of the so-called 'traffic industries'. Dutch cargo ships brought such goods as grains and timber from the Baltic countries and tropical and subtropical products from the Far East and Mediterranean region. In the 'traffic industries', established in such places as Haarlem, Dordrecht and the Zaan district (NW of Amsterdam) these raw materials were refined. The power was mainly supplied by the wind. In addition to the windmills which regulated the water economy, there were also formerly in the Netherlands countless timber sawmills, corn mills, etc. Peat was also used as a source of power supply.
These industries did expand further during the 18th and 19th centuries (together with the industries based on locally grown agricultural products), but there was no explosive growth in the Netherlands, such as occurred in Britain and Germany during the 19th century.

The 20th century
After 1900 the exploitation of coal and, particularly, the rising demand for employment brought about a change in this situation. The government began to play a more active part, mineral extraction increased, new industries, such as chemicals and electrical engineering, were established. Two world wars and the intervening world depression, however, slowed down the development.
After 1945 there followed a few years of reconstruction and adaptation to the changed international situation, including the gaining of independence by Indonesia.
The greatest expansion in Dutch industry took place after 1945, as is illustrated by the index figures given below of the volume of industrial production:

(1938 = 100)
1930 - 96
1946 - 74
1958 - 204
1970 - 500
1977 - 635

The result of this has been that, in 1977, 38% of the national income was derived from industry, while 84% of total exports consisted of manufactures. Labour productivity has greatly increased during this period, thanks to mechanisation and automation. The numbers employed have been declining since about 1970, both relatively and absolutely.
Other important new elements in the developments after 1950 included the great expansion of the petro-chemical industry and the growth in foreign investments. Reference was already made on p. 24 to the stagnation of the rapid economic growth after about 1974 and, therefore, also that of industrial production.

Location
The historical development described above makes it apparent that industry in the Netherlands has traditionally been concentrated in the ports. Later, industry also developed elsewhere in the country, partly with government support (see p. 24), but the western coastal provinces remain the industrial centre of gravity.
Tendencies which have appeared in all industrial countries in respect of the choice of industrial locations have also played a part here. Firms preferably establish themselves nowadays in the vicinity of seaports (= relatively cheap transport) and in large agglomerations (favourable industrial climate in respect of infrastructive labour supply, markets, etc). Only the Randstad satisfies both conditions. In the other parts of the Netherlands, industrial development proceeded with much greater difficulty. On the sandlands of the east and south the farmers formerly carried on cottage industries, from which developed, among other things, the textile industry in towns such as Tilburg and Enschede. It is precisely these labour-intensive industries which now find themselves in great difficulties as a result partly of international structural changes. The consequence has been factory closure and mergers.
Other areas, such as the province of Groningen and South Limburg acquired industries when people began to process the locally available raw materials. In this way arose agriculturally-based industries in the north and the chemical industry in the south. The presence of deep, navigable water led further to the establishment of industry along the Western Scheldt in the south-west, and along the Eems in the north-east of the country.
As has already been remarked, the distribution of industry over the country is irregular and often unfavourable relative to the labour supply. The bar chart emphasises once more to what extent industry is concentrated in the western coastal provinces, while the south – centrally located between industrial regions in Germany and Belgium – also has an important share. The east and, particularly, the north lag far behind.



Employment in Industry per Region as % of National Total, 1976

NORTH	EAST	WEST	S.W.	SOUTH
10,2	19,8	39,6	2,2	28,1

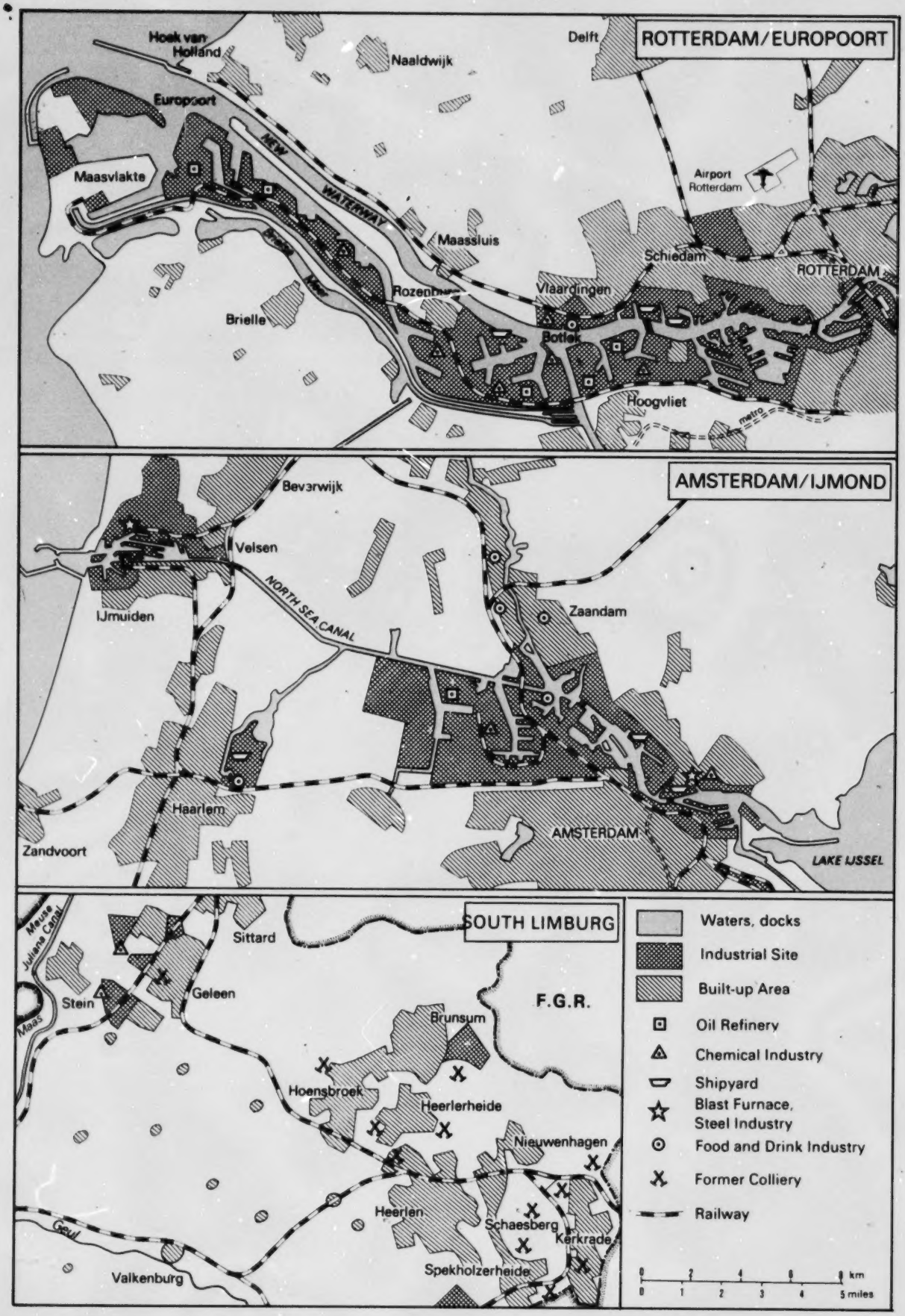
Industry II

The general introduction we have just given about the origin and distribution of industry in the Netherlands is followed by a description of three important industrial regions: the port and agglomeration related industrial zones along the New Waterway (Rotterdam) and North Sea Canal (Amsterdam) and the restructuring region of South Limburg.

Rotterdam-Europort
The great flowering of Rotterdam as a port city began in about 1870 and was related to the rapidly intensifying trading contacts with the German hinterland (rise of the Ruhr region, free navigation on the Rhine from 1868) and the greatly improved connection with the sea (New Waterway, 1872). Up to the Second World War, therefore, the emphasis was very much on transit trade. The port zone had expanded spatially westwards from the centre of Rotterdam as far as Schiedam. In these older parts of the port the accent is on the transhipment and trading function; there was also a development of ship-building and repairing.
After the war and the phase of post-war reconstruction the expansion westwards, along the left bank of the Meuse, continued at an increased rate. There first arose in about 1955 a port zone with mixed industry around the Botlek. Subsequently, in the 1960's, the Europort project was realised on the island of Rozenburg, with predominantly petrochemical industries. This did not yet satisfy the hunger for port and industrial sites, however, and 1974 saw the beginning of the lay-out of the Maasvlakte, a platform of sand built out into the North Sea. With the dredging of a 10 kilometre channel in the floor of the North Sea the Europort area was made accessible for ships of up to 250 or 300 thousand tons.
This spatial expansion was accompanied by a greater diversification of functions. Numerous industries were established around the new port basins, with petrochemicals in the majority. The transhipment of ores and container traffic also occupy an important place. The share of direct overseas transit trade has fallen from 75% in 1938 to 25 to 30% at present.
Partly because of environmental objections, the proposal to build an iron and steel works on the Maasvlakte has been abandoned.

Amsterdam-IJmond (entrance to North Sea Canal)
Since the last century the port of Amsterdam has undergone a different development from that of Rotterdam. Up to the Second World War, Amsterdam played an important role in Western Europe as an entrepôt for tropical products. Subsequently, transit trade gained in importance, but the geographical situation is much less favourable in this respect than that of Rotterdam. The connections both with the sea and the hinterland (the Rhine) consist of canals entered by locks: North Sea Canal (1876) and Amsterdam-Rhine Canal (1952).
After the war the port and industrial zone of Amsterdam also expanded in a westerly direction. Amsterdam has the largest number of industrial workers in any Dutch city. In part, the pattern of industry shows marked parallels with Rotterdam: petrochemical and food and drink industries, shipbuilding and repairs etc. Some of the industries of Amsterdam, however, are less tied to the port than those of Rotterdam and often have a craft character (clothing, diamond cutting). An iron and steel works began operating at the seaward entrance to the North Sea Canal in 1924. Iron ore and (since the closing of the Dutch mines) coal have to be imported from overseas. In this respect, the works, with its own docks on the seaward side of the locks, has an ideal situation. Apart from crude iron, steel and steel products are manufactured, as well as cement and fertilisers in subsidiary plant. In 1972 there was a merger with a West German steel processing concern.

South Limburg
Towards the end of the 19th century and during the first quarter of the 20th century, twelve coal mines came into exploitation in South Limburg, beginning with private capital with later, a contribution by the State. Mining ceased here completely between 1966 and 1975. The exploitation of the generally deep and thin coal seams proved to be no longer economically justified. Greatly increased labour costs and competition from the natural gas discovered in the North Netherlands in 1960 largely contributed to this rapid and partly unexpected closure. This obviously confronted the region with great problems, particularly the Eastern sector adjoining the German border, including Heerlen etc. This area was more exclusively dependent on mining than the western mining district, where a varied chemical industry had developed in and around Geleen. With the supply of petroleum and natural gas by pipeline this industry was able to continue after the closure of the mines.
In 1973 South Limburg was designated a 'Restructuring Region' within the framework of the regional socio-economic policy. Designation permits the introduction of measures such as retraining of workers, establishment of new industries and augmentation of the number of jobs in the services sector, for example, by transferring central government services from the western Netherlands to Heerlen.


ROTTERDAM/EUROPOORT
Hoek van Holland
Naaldwijk
Delft
Europoort
Maasvlakte
NEW WATERWAY
Maassluis
Airport Rotterdam
Schiedam
ROTTERDAM
Vlaardingen
Rozenburg
Brielle
Botlek
Hoogvliet
metro
AMSTERDAM/IJMOND
Beverwijk
Velsen
IJmuiden
NORTH SEA CANAL
Zaandam
Haarlem
Zandvoort
AMSTERDAM
LAKE IJSSEL
SOUTH LIMBURG
Meuse
Juliana Canal
Maas
Sittard
Geleen
Stein
F.G.R.
Brunsum
Hoensbroek
Heerlerheide
Nieuwenhagen
Heerlen
Schaesberg
Kerkrade
Geul
Valkenburg
Spekholzerheide
Waters, docks
Industrial Site
Built-up Area
Oil Refinery
Chemical Industry
Shipyard
Blast Furnace, Steel Industry
Food and Drink Industry
Former Colliery
Railway
0 2 4 6 8 km
0 1 2 3 4 5 miles

Trade and Traffic

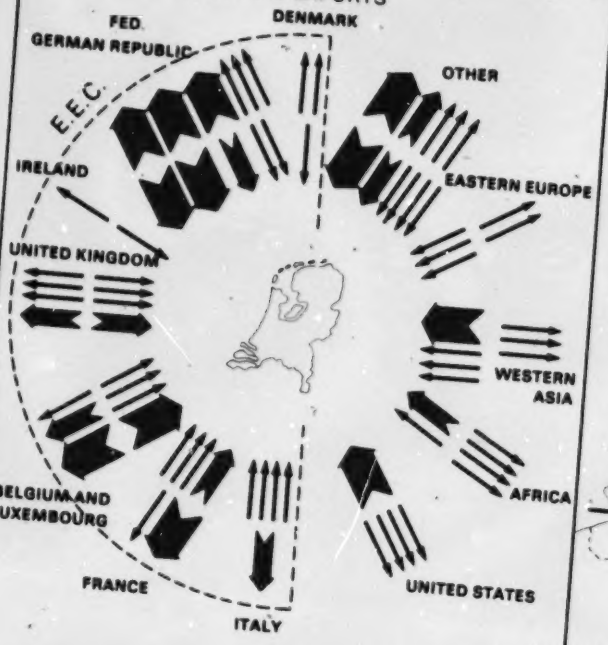
Foreign Trade
It has already been stated in earlier sections that the the Dutch economy is strongly orientated towards foreign countries. This is expressed in the extensive foreign trade: in 1977 imports amounted to 8,077 guilders per head of population and exports to 7,737 guilders per head. Manufactures were the most important items of both imports and exports (e.g. import of motor cars, export of electrical apparatus). Second place amongst imports is taken by fuels and raw materials (petroleum, iron ore); while agricultural products (livestock and horticultural products) take second place among exports.
The first map on the adjoining page shows the countries with which the Netherlands does the most trade. A striking feature is the large proportion accounted for by the EEC partners; in 1977 they provided 55% of the imports and took 70% of the exports.
The Netherlands is generally not able to maintain a balance between the value of imports and exports. During the 1960's exports did not cover more than 80 to 90% of imports. There was a temporary improvement in the situation at the beginning of the 1970's, mainly through the export of natural gas. There is always a surplus on the services account, partly accounted for by goods transport for other countries by ocean-going ships, inland shipping and goods lorries.

Inland traffic and transport
The infrastructure maps showing traffic by water, rail and road indicate the density of these different traffic networks. The waterways map shows only those routes where the maximum permitted capacity does not fall below 1,000 tons. This accounts for nearly half the total waterway network of 4,360 km. (the many apparently dead-end waterways are generally continued by channels of a lower order). The railway map shows all the lines in use for passenger traffic. This network comprises 2,500 km., in addition to which there are a number of lines for goods traffic only. The road map shows all the so-called 'European' (E) roads, all the motorways and a limited selection of the other important link roads.
All three maps show the provincial capitals and towns with more than 100,000 inhabitants. In this respect it is noteworthy that all these towns occupy an important position in the road and rail network, but that a third of them have to manage without an important waterway connection. In explanation of this it may be argued that, in the first place, the waterway network has been somewhat more determined by natural factors, while a further important factor is that particularly since the Second World War, inland shipping has concentrated very much on the foreign connections, with internal goods transport being taken over increasingly by road traffic, as appears from a study of the diagrams under the maps. A comparison of the road and rail networks, which exhibit a great similarity in broad outline, shows that road traffic takes much more rapid advantage than do the railways of the new possibilities afforded by civil engineering works such as the Zuyder Zee and Delta projects.

Aviation
In the airport of Schiphol, S.W. of Amsterdam, the home base of the K.L.M., the Netherlands possesses an important airfield with the most modern equipment. Numerous companies operate regular European and inter-continental services. Because of the short distances internal air traffic is of very limited extent.

Government policy
The disadvantages of the uncontrolled growth of traffic and of the infrastructure which this requires have become clear to many people in recent years: they include noise nuisance, air pollution, use of expensive space and energy, danger to life and limb. Recent government plans in the field of planning and traffic take these into account. In taking decisions about extensions to the traffic infrastructure, many aspects of amenity are given careful consideration. Such decisions are the subject of detailed public participation procedures (see also p. 38).
In making the decisions, the aim is to achieve integration in a number of fields:
– integration of transport and other sectors of physical planning; for example, by bringing work and recreation closer to residences, the traffic demand decreases.
– integration of the different forms of transport: according to local conditions, priority is given to infrastructure measures which will help motor traffic, public transport or the use of bicycle and moped.
– integration in the sphere of policy between the various authorities themselves and between the authorities and the transport undertakings.
It is hoped to reduce the mobility of the population by means of guiding measures in many fields (this concerns not only the number, but particularly the length, of trips).

VALUE OF IMPORTS AND EXPORTS



(1977)

10.000 Millions of Guilders

5.000 Millions of Guilders

1.000 Millions of Guilders

NAVIGABLE WATERWAYS

(1975)

INLAND SHIPPING

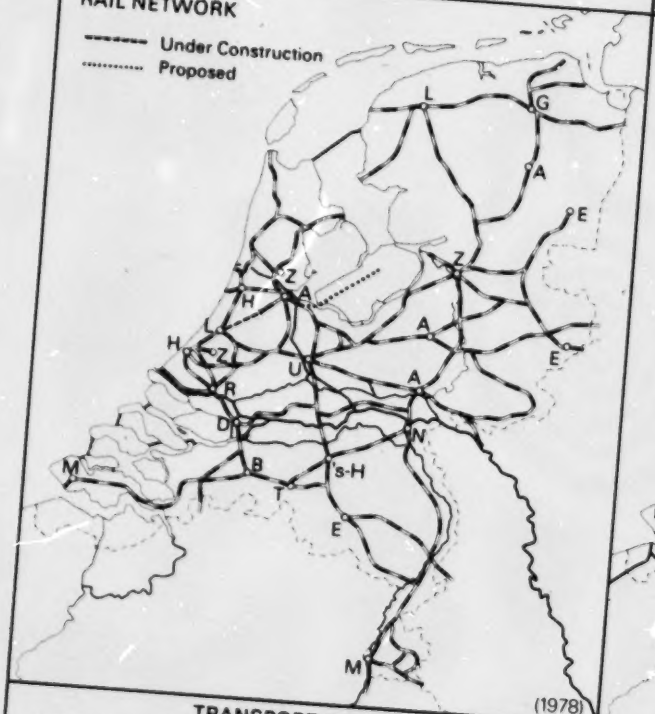
22% of inland goods transport in tonnes

29% of inland goods transport in tonne - Km.

RAIL NETWORK

Under Construction

Proposed



(1978)

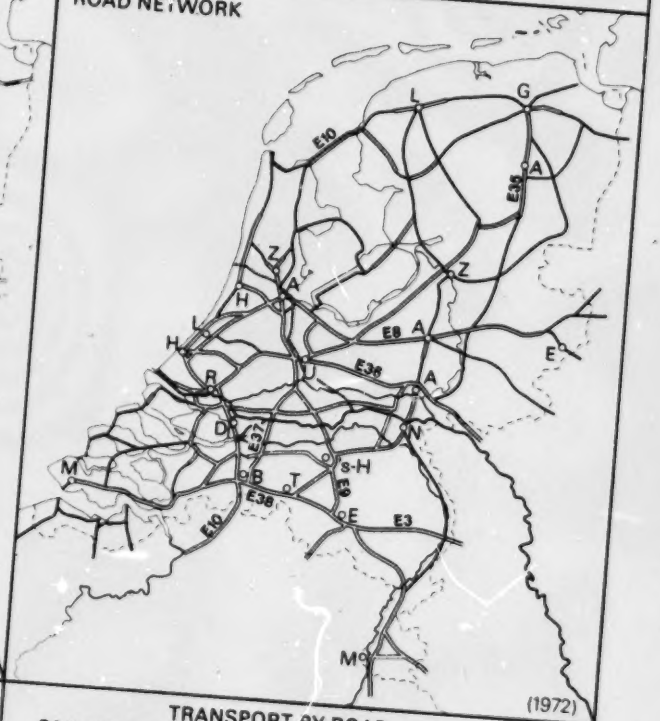
TRANSPORT BY RAIL

7% of internal passenger transport in passenger - Km.

4% of internal goods transport in tonne - Km.

(1976)

ROAD NETWORK



(1972)

TRANSPORT BY ROAD

81% of internal passenger transport in passenger - Km.

67% of internal goods transport in tonne - Km.

(1976)

Amsterdam and Rotterdam

The Netherlands' two largest cities have already been referred to several times on the preceding pages: as the main elements in the two wings of the Randstad (pp. 22-23), as port and industrial zones (pp. 32-33). In this section it is mainly the town planning aspects which are discussed. Reference will be made to certain developments which are also in evidence in many other Dutch cities.

History

In broad outline, many parallels may be observed in the historical development of Amsterdam and Rotterdam. Both cities grew up at sites where, in the Middle Ages, a dam was constructed in a small river (Amstel and Rotte) to reduce the danger of flooding. They subsequently developed into the two largest port cities of the Netherlands in the Golden Age. In about 1650, Rotterdam had some 50,000 inhabitants, Amsterdam more than three times as many.

Urban pattern

The adjoining maps show for each city, the old city centre, the neighbourhoods built in the 19th and early 20th century, those built between the wars and, lastly, the neighbourhoods dating from after 1945.

Particularly since the Second World War the centres of the two cities have become completely different in character.

Amsterdam is famous for its rings of 17th century canals, countless bridges and old merchants' houses. The historic centre of Rotterdam was not rebuilt in the old style after the bombing of 1940. There arose instead a modern, large-scale business and entertainment centre, crossed by wide traffic streets and spacious pedestrian promenades. The residential function was greatly reduced.

The problems are also very different.

The preservation of the valuable historical character of the centre of Amsterdam demands great efforts. Nearly 7,000 premises have been designated as 'monuments', the restoration of which requires large sums of money. The old centre is totally unsuited to modern traffic, so that access, particularly by car, is a great problem for the many shops and offices.

In Rotterdam many of the inhabitants find the large-scale character of the reconstructed centre rather unattractive.

Population	1st January	Amsterdam	Rotterdam
Municipality	1969	845,821	699,245
	1978	728,746	590,312
Agglomeration	1969	1,046,063	1,059,646
	1978	965,246	1,017,136

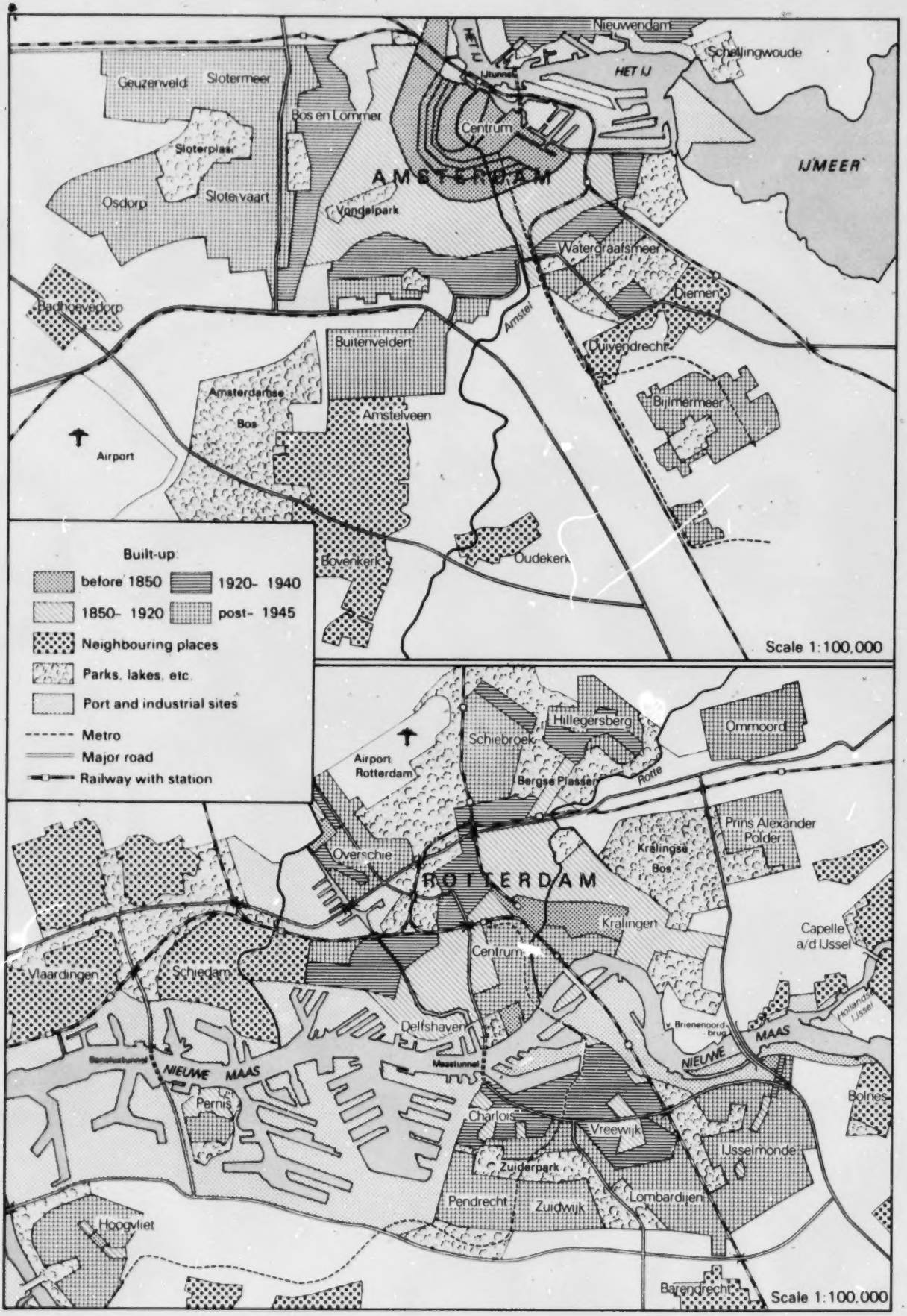
By strengthening the residential function where possible and by planting trees, laying-out cafe terraces, building small shops, etc., it is hoped to create something more congenial.

As far as the 19th century districts surrounding the centre are concerned, which were put up rapidly at the time of the industrial revolution in these and other cities, the problems are comparable. Bad living conditions necessitate radical improvements which have been too long delayed by economic depressions and world wars. After the war there was an initial inclination to clear these neighbourhoods completely and replace them with new development, partly of dwellings, partly of offices, shops, recreational facilities and traffic infrastructure. After some years a more differentiated approach was developed: only the worst properties were completely replaced (reconstruction), while the rest were subject to 'renewal' (i.e. improvement of the quality of the existing premises).

Even before the Second World War and particularly in the years following, there arose a great need in both cities for land for residential expansion. Reasons for this were the growth in population, the replacement of destroyed or demolished houses, and the decline both of the average dwelling occupancy and of the average number of dwellings per hectare. In both cities space was found in the remaining territory of the municipality, enlarged particularly in Rotterdam by the annexation of fringe municipalities. Further growth took place in smaller places in the vicinity, which developed greatly as commuter settlements. With both cities there also developed a satellite town: Hoogvliet near Rotterdam and Bijlmermeer near Amsterdam, both connected by a recently constructed metro line with the city centre.

The high rise development which has been much used in these and other new neighbourhoods does not meet the housing desires of the majority of the population. The families with children, in particular, prefer single family houses with gardens. These are usually available only in more remote small settlements, which are becoming suburbanised (cf. pp. 22-23).

The figures above show how the populations of both the municipality and the agglomeration have declined in both Amsterdam and Rotterdam.


Nieuwendam
Schellingwoude
HET IJ
IJtunnel
Geuzenveld
Slotermeer
Bos en Lommer
Centrum
Sloterplas
AMSTERDAM
IJMEER
Osdorp
Slotervaart
Vondelpark
Watergraafsmeer
Badhoevedorp
Diemen
Amstel
Buitenveldert
Duivendrecht
Amsterdamse Bos
Amstelveen
Bijlmermeer
Airport
Built-up:
before 1850
1920- 1940
1850- 1920
post- 1945
Neighbouring places
Parks, lakes, etc.
Port and industrial sites
Metro
Major road
Railway with station
Bovenkerk
Oudekerk
Scale 1:100,000
Hillegersberg
Ommoord
Schiebroek
Airport Rotterdam
Bergse Plassen
Rotte
Prins Alexander Polder
Overschie
Kralingse Bos
ROTTERDAM
Kralingen
Capelle a/d IJssel
Centrum
Vlaardingen
Schiedam
Delfshaven
Nieuwe Maasbrug
Hollandse IJssel
Beneluxtunnel
NIEUWE MAAS
Maastunnel
Pernis
Charlois
Vreewijk
Bolnes
IJsselmonde
Zuiderpark
Pendrecht
Zuidwijk
Lombardijen
Hoogvliet
Barendrecht
Scale 1:100,000

Physical Planning I

Development

In a densely populated country like the Netherlands the careful drawing up and implementation of plans for the future spatial organisation of the country is an obvious necessity. The legislation framework for this is contained in the Physical Planning Act of 1965, which became law after a long period of gestation, beginning with the Housing Act of 1901. Recent developments have prompted the preparation of further legislative measures.

The following are some aspects of post-war developments:

– physical planning acquired a more scientific basis in the development of 'planologie' (planning science), which may now be studied at seven Dutch universities and institutions of higher education.

– apart from planning in urban areas, there also arose an interest in physical planning in rural areas.

– planning has undergone an enlargement of scale: physical planning should be practised not only from the standpoint of local attitudes and interests, but also at the regional, national and international levels.

– the stage of laying down a physical structure for a particular point of time in the future has been replaced by an attempt to achieve a more flexible response to constantly changing developments; this is called 'process planning'.

Organisation

The organisation of physical planning in the Netherlands, as laid down in the Act of 1965, is based on the three existing levels of government: central, provincial and municipal.

The *central* government sets out the main lines of physical planning policy in reports and structure schemes. It also exercises supervision over the policies of the lower tier authorities and settles differences between them. The *provinces* may draw up sub-regional plans for parts of their territory and they exercise supervision over the policies of the municipalities.

The Act of 1965 assigns a very important task to the *municipalities*. In addition to the structure plans for the whole of their territory, they draw up development plans. The present organisational structure of physical planning places great emphasis on these development plans.

In what respects does the development plan differ from all the other kinds of plan referred to?

– the municipality is *obliged* to prepare development plans for its undeveloped areas and such a plan is sometimes also drawn up for other areas, such as a town centre which is to be rehabilitated.

– once accepted by the municipal council and approved by the province, the provisions of the development plan are *legally binding* for everyone. Building licences are issued only if they are in conformity with the development plan. Failure to conform to the plan results in an appearance before the magistrate, while any structures are demolished at the offender's expense.

The map illustrates the increasing detail of the plans at the regional and local levels.

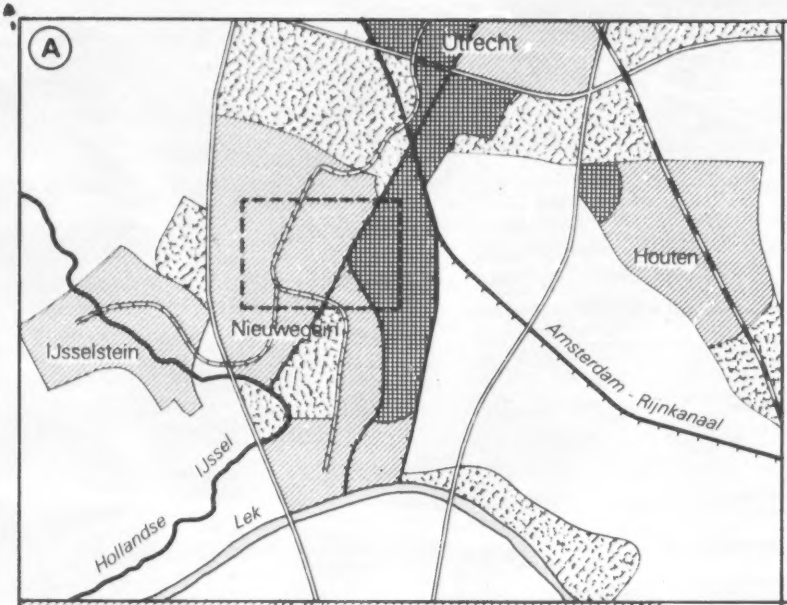
Public participation

The legislation provides for detailed informational and public participation procedures in respect of the plans, reports etc. referred to above. In general, the following procedure is followed: firstly, a draft plan is published by the public authority concerned, to which the maximum publicity is given by means of laying it open to inspection in numerous places, informational meetings, notices in the mass media etc. Every citizen or social grouping may comment on the plan, either in writing, or verbally at a public hearing. In the event of policy intentions at the national level, a compilation of these comments is published ('Planologische Kernbeslissing' [Key Planning Decision] procedure). The authority then draws up a definitive plan, which takes the comments into account and which has to be democratically approved by Parliament, the provincial states or the municipal council.

In view of the binding character of the municipal development plan, it is the procedure for this which contains the most safeguards for the citizen. There are, for example, ample possibilities for appealing against a development plan or for claiming compensation.

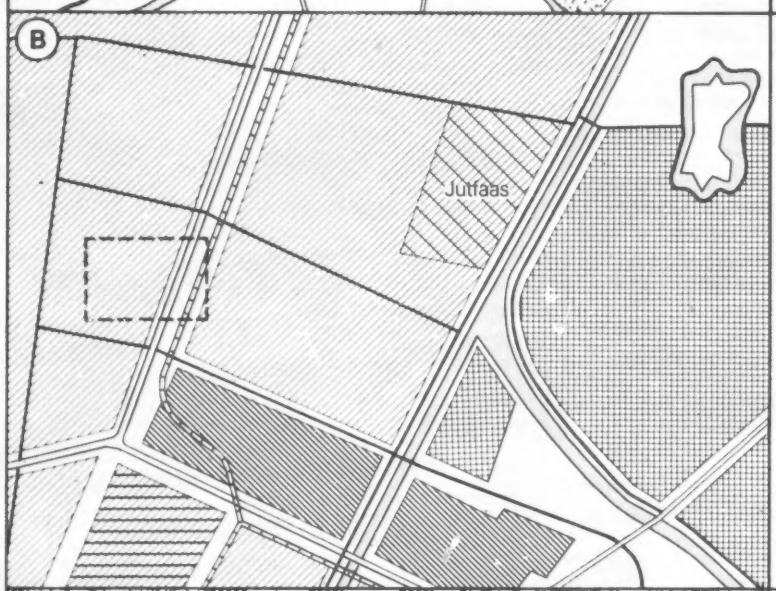
Drawbacks

The existing legislation has been found in practice to contain certain drawbacks, which it is hoped to abolish in future amendments to the law. The strong emphasis on the municipal development plan, for example, does not accord with the efforts to achieve enlargement of scale. Since the 833 municipalities form too narrow a framework for an effective planning policy and the eleven provinces one that is too wide, this is one of the reasons why an administrative reorganisation is being considered. In it the eleven provinces would be replaced by about 20 smaller ones. Another drawback is that the wide opportunities for appeal can result in lengthy delays, so that the implementation of a development plan may be delayed by as muchfor five years.



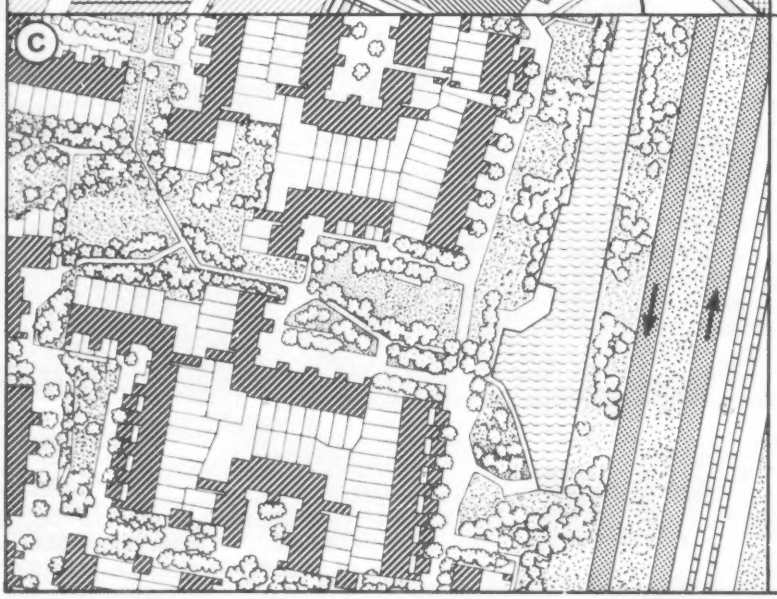
A. SUB—REGIONAL PLAN
FOR CENTRAL
AND S.E. UTRECHT
(extract), scale 1:100,000

- Residential area
- Work Area
- Park Area
- Agricultural Area
- Motorway
- Railway
- Express Tramway
- Canal
- Limit of Map B



B. STRUCTURE PLAN
FOR NIEUWEGEIN (extract),
scale 1:20,000

- Residential area
- Existing Development
- High-Rise Development
- Work Area
- Central area Facilities (city centre)
- Roads
- Express Tramway
- limit of Map C



C. DEVELOPMENT PLAN
FOR DE BATAU
(extract) Scale ca. 1:2,400

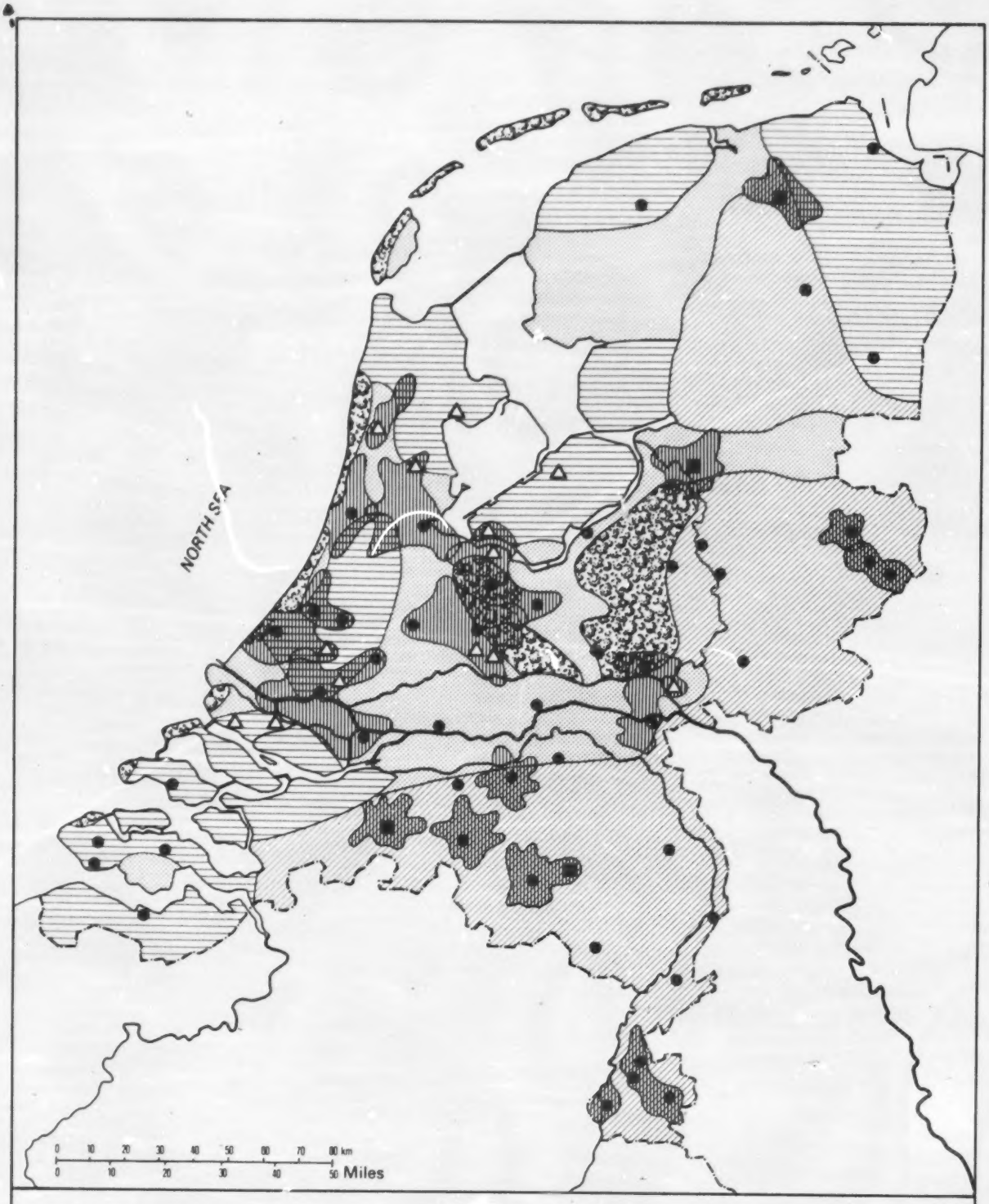
- Single family houses
- Gardens
- Public Open Space
- Trees
- Water
- Road
- Express Tramway

Physical Planning II

Government Reports
After the first and second reports on the physical planning of the whole country, which appeared in 1960 and 1966, respectively, a start was made in 1974 with the separate parts of the current Third Report on Physical Planning of the Netherlands. The need for this new report, a relatively short time after the publication of the detailed Second Report, rested, among other things, on the following points:
– certain basic assumptions, concerning, for example, population growth, proved not to have been realised (see p. 18).
– it proved to be not possible to realise important elements of the policy outlined in 1966, such as the migration to the North and the restriction of suburbanisation in the central zone of the Randstad.
– assumptions concerning such matters as the achievement of economic growth and the increase of mobility proved to be undergoing a radical modification as a result, for example, of concern for the environment and the scarcity of fuels and raw materials.
The first part of the Third Report ('Orientation Report') was concerned with these background aspects and assumptions and took them as a basis for a number of policy proposals.
Part 2 of the Third Report, the Urbanisation Report, appeared in 1976 and Part 3, the Report on the Rural Areas, in 1977. The adjoining map page contains illustrations of the major structural elements from the Urbanisation and Rural Areas reports. In addition to the three reports there are the 'Structure Schemes', which deal with particular aspects of physical planning, usually relating to infrastructure.

Urbanisation Report
The urbanisation report refers to a number of city regions, which partly overlap each other in the west of the country and so form the northern and southern arms of the Randstad. This is where the greatest problems are located, for the solution of which the strict dispersal policy of the 50's and 60's has been largely abandoned. Further urban growth must be accommodated within or in the vicinity of the Randstad wings. The unrestricted migration from the Randstad to the provinces of North Brabant and Gelderland must be restrained. The displacement of part of the urban growth to peripheral areas in the North East and South East of the country is being propagated less emphatically than previously. By concentration in the city regions and accommodation of the growth in a limited number of growth towns outside the Randstad and in growth nuclei in or near the Randstad, it is hoped to prevent both urban decay and the gradual suburbanisation of the whole country.
Within the concentration areas the phenomena of congestion – relating to residence and traffic, recreation and environment etc. – must be countered. Among the means of achieving this are the bringing closer together of home and work and encouragement of the use of public transport and cycles or mopeds. The quality of the urban residential environment must be preserved or improved, especially by rehabilitation of the older urban quarters (cf. p. 36). This may also help to restrain the widespread suburbanisation process (cf. p. 22).

Rural areas
Clearly underlying the Report on Rural Areas is the realisation that the non-urbanised part of the country may no longer be regarded purely as an area for agricultural production. Joint use by the non-agricultural population, care for nature and landscape conservation are playing an increasing role. This does not make the taking of decisions about the physical planning of the rural areas any simpler, bearing in mind the often conflicting interests. In order to bring some clarity into the situation the Rural Areas report introduces a system of zoning upon which the spatial policy can be based. The following zones are distinguished:
a – areas with agriculture as the principal function. The first purpose of the policy will be to serve the interests of agriculture.
b – areas with a mixture of agriculture and other functions in larger spatial units. According to circumstances, agricultural interests or those of recreation and nature conservation will take first place.
c – areas with a mixture of agriculture, nature and other functions in smaller spatial units. Preservation of the attractive, varied landscape should here receive priority, but the interests of agriculture must not be overlooked.
d – areas with 'nature' as their principal function. Nature conservation obviously takes first place here and the interests of agriculture and recreation are subordinated to it.
e – areas within the urban sphere of influence. These largely coincide with the zones shown on the map as urban areas. The desired variety will have to be assured through the preservation of the non-urban landscapes within these zones. Where possible, recreational sites may be included.


NORTH SEA
0 10 20 30 40 50 60 70 80 km
0 10 20 30 40 50 Miles
Areas with agriculture as main function
Areas with mixed agricultural and other functions, in large spatial units
Areas with mixed agricultural, nature and other functions in small spatial units
Areas with nature as main function
City Regions
Growth Towns
Growth Centres
Other Urban Centres

The Environment

In all modern countries an increasing pollution of the environment, natural or otherwise, may be observed, the combatting of which demands ever greater sacrifices. In the Netherlands the pollution problem has certain specific aspects which are closely linked with the geography of the country. The maritime situation, for example, together with the low-lying character of the coastlands, gives rise to a serious salt seepage problem. The great European rivers, the Rhine, Meuse and Scheldt, transport many waste products to the Netherlands. The high population density and the associated intensive use of land also increase the intensity of all forms of pollution. The prevailing south-westerly winds carry inland the air pollution from the industries established in the coastal areas.

Water pollution

The ground and surface water are polluted in the first place by the discharge of waste products from the settlements and enterprises in the country itself, which are constantly increasing in number and size. Added to this is the strongly polluted water brought into the country by the great rivers, particularly by the Rhine. Many measures are being taken on an increasingly large scale, both to remove the causes of pollution (eg sewage purification plant) and to combat its consequences (eg water supply reservoirs; see p. 16). A completely different threat to water quality is formed by the seepage of salt water. In rivers and canals the salt penetrates many kilometres inland from the sea. In large parts of the Low Netherlands fresh groundwater is either absent or present to only a shallow depth (see the boundary on the map). This threat demands quite different measures, such as the separation of fresh and salt water by means of dams (as in the Delta) and air bubble screens in lock complexes, the ensuring of adequate discharge of fresh water by means of dams and weirs (see p. 16) etc.

Air pollution

Large complexes of basic industries, such as the petrochemical industries of Rotterdam-Europort, are the greatest culprits here. In addition, there are offensive smells caused by traffic and polluted surface water etc. Countermeasures up to the present have been very incidental in character, eg dust filters in chimneys, the construction of extra tall chimneys etc. A network of 220 measuring stations came into operation in 1978. Only in the area around Rotterdam, where such measuring stations have been in existence for several years, can the readings lead immediately to the taking of measures based on voluntary collaboration by industry, in the event of the occurrence of unfavourable conditions. The map shows that, in the southern and eastern frontier regions, air pollution occurs originating from the industrial zones of Belgium and Germany. The conversion from coal and oil to natural gas during the course of the 1960's had a favourable effect (cf. p. 28).

Legislative measures

The forms of environmental pollution referred to above and others, such as the thermal pollution of surface water, radio-active contamination of water and air, noise nuisance, soil pollution etc, can only be countered effectively with the aid of efficient legal measures. In 1970 laws came into force dealing with water and air pollution, in 1977 followed a law dealing with the pollution of seawater and a waste products act. Laws are in preparation for the other forms of environmental pollution. They are all based on the principle that pollution as such is forbidden. Under certain conditions exemptions may be granted from this prohibition, for which the 'polluter' must pay. The money received by the government in this way can be invested in the fight against pollution.

A separate problem is the processing of industrial and household waste, the largest part of which still goes to refuse tips, a procedure to which there are great environmental objections. From a small portion compost is made, while increasing amounts are disposed of by incinerators. A large incinerator in the port area west of Rotterdam uses the heat it produces to generate electricity and to distil water.

International aspects

As noted above, features of the geography of the Netherlands – such as its situation on the lower reaches of various great rivers – imparts to the environmental problem there a particular international aspect. The chief actor is the Rhine, which brings in no less than two thirds of all the water present in the Netherlands. Before this river passes the Dutch frontier it flows among the homes and workplaces of many tens of millions of Europeans. The Rhine is consequently Europe's most polluted great river and improvement in this situation can only be the result of intensive international co-operation. In 1976, after years of negotiation, the riparian states for the first time achieved results in the form of agreements concerning pollution from salt and chemical substances. In so doing, the Netherlands has had to abandon the principle of the 'polluter pays' and will now pay 34% of the costs of storing the waste salts from the French potash mines of Alsace underground. International agreement is also urgently necessary in respect of the combatting of pollution from the Meuse, the Wadden Sea, the North Sea etc.

Sulphur Dioxide in the Air:
(1976/1977)

- < 75 micrammes / m³
- 75-100
- 100-125
- > 125

Drinking Water Supply:

- Drinking Water Reservoirs
- Dune Filtration Areas
- River Water Aqueducts
- Boundary of Salt Penetration in Ground Water